This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

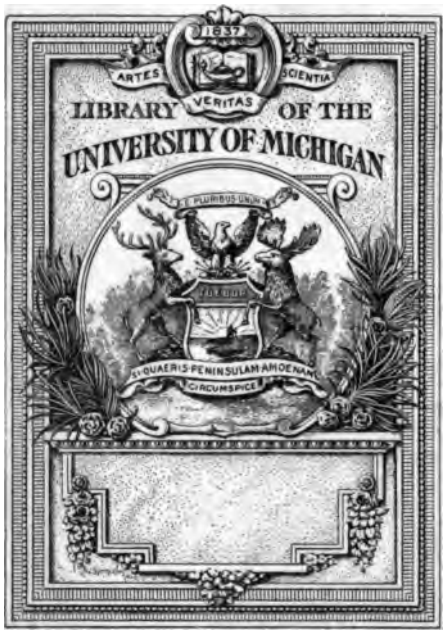
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

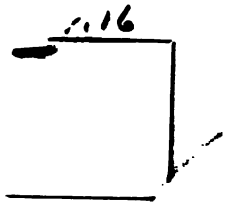
+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`



THE GIFT OF
U.S. Supt. Pub. Doc.



5285 60th Cong 1st Sess Ho. Doc. v.16

ANNUAL REPORTS, WAR DEPARTMENT

FISCAL YEAR ENDED JUNE 30, 1907

REPORT OF THE

CHIEF OF ENGINEERS U. S. ARMY

1907

IN THREE PARTS

PART III

WASHINGTON
GOVERNMENT PRINTING OFFICE
1907

APPENDIXES

TO THE

REPORT OF THE CHIEF OF ENGINEERS,

UNITED STATES ARMY

(CONTINUED).

203294

APPENDIX K K.

IMPROVEMENT OF RIVERS AND HARBORS ON THE NORTHERN AND WESTERN SHORES OF LAKE MICHIGAN.

REPORT OF MAJ. W. V. JUDSON, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Manistique Harbor, Michigan.
2. Gladstone Harbor, Michigan.
3. Menominee Harbor and River, Michigan and Wisconsin.
4. Oconto Harbor, Wisconsin.
5. Green Bay Harbor, Wisconsin.
6. Sturgeon Bay and Lake Michigan Ship Canal, and harbor of refuge connected therewith, Wisconsin.
7. Operating and care of Sturgeon Bay and Lake Michigan Ship Canal, Wisconsin.
8. Algoma Harbor, Wisconsin.
9. Kewaunee Harbor, Wisconsin.
10. Two Rivers Harbor, Wisconsin.
11. Manitowoc Harbor, Wisconsin.
12. Sheboygan Harbor, Wisconsin.
13. Port Washington Harbor, Wisconsin.
14. Harbor at Milwaukee, Wisconsin, including harbor of refuge.
15. Milwaukee Inner Harbor, Wisconsin.
16. Racine Harbor, Wisconsin.
17. Kenosha Harbor, Wisconsin.
18. Waukegan Harbor, Illinois.
19. Fox River, Wisconsin.
20. Operating and care of locks and dams on Fox River, Wisconsin.
21. Removing sunken vessels or craft obstructing or endangering navigation.

UNITED STATES ENGINEER OFFICE,
Milwaukee, Wis., July 6, 1907.

GENERAL: I have the honor to transmit herewith annual report for the works of river and harbor improvement in my charge for the fiscal year ending June 30, 1907.

Very respectfully,

W. V. JUDSON,
Major, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

K K 1.

IMPROVEMENT OF MANISTIQUE HARBOR, MICHIGAN.

Operations during the fiscal year.—No construction work has been in progress, the conditions required by act approved March 3, 1905, relative to donation of necessary land not having been complied with.

The title to the land required on the west side of the harbor is held by the Chicago Lumbering Company and the Manistique, Marquette and Northern Railway Company. The Ann Arbor Railroad Company also has a leasehold interest in the same property.

The Chicago Lumbering Company has already transferred its interest in the land to the United States, but the Ann Arbor Railroad Company so far has refused to relinquish its leasehold, which it derives from the Manistique, Marquette and Northern Railway Company. This refusal is due to differences between the railway companies, which it is believed will be adjusted in time.

Condition of the improvement.—No soundings have been taken in the channel since the completion of the survey of 1903. It is believed that the condition of the channel is practically the same as at that time, which is fully described in report on said survey, published in Annual Report for 1904, Part 3, page 2869.

Remarks.—For reasons stated in Annual Report for 1905, page 2014, it is recommended that if the approved project of improvement is to be carried out by the Government the balance of the estimate remaining unappropriated and amounting to $220,000 be made available.

Money statement.

July 1, 1906, balance unexpended	$22,614.55
Amount appropriated by river and harbor act approved March 2, 1907	25,000.00
	47,614.55
June 30, 1907, amount expended during fiscal year, for works of improvement	23.74
July 1, 1907, balance unexpended	47,590.81
Amount (estimated) required for completion of existing project	220,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	220,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

June 14, 1880	$5,000
March 3, 1881	1,000
March 3, 1905	25,000
March 2, 1907	25,000
Total	56,000

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. E. W. Miller, deputy collector of customs, Manistique, Mich.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	38	39
Sail	41	41
Total	79	80

By way of the harbor.

	Net tons.
Shipments	88,828
Receipts	4,079
Total	92,907
Tonnage in calendar year ending December 31, 1905	93,141
Decrease in 1906	234

Principal articles shipped.—Lumber, pig iron, and general merchandise.
Principal articles received.—Coal, grain, iron and steel, and general merchandise.

K K 2.

IMPROVEMENT OF GLADSTONE HARBOR, MICHIGAN.

Operations during the fiscal year.—No work has been in progress.

Condition of the improvement.—Soundings completed January 9, 1907, indicate that no material shoaling has occurred over the area dredged in 1905.

Remarks.—The funds available are believed to be sufficient for maintenance until June 30, 1909; therefore no apropriation is recommended at the present time.

Money statement.

July 1, 1906, balance unexpended	$6,719.41
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	247.17
July 1, 1907, balance unexpended	6,472.24

APPROPRIATION.

March 3, 1905	$14,000

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. P. B. Hammond, agent, Minneapolis, St. Paul and Sault Ste. Marie Railway Docks, Gladstone, Mich.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	302	303
Sail	9	9
Total	311	312

By way of the harbor.

	Net tons.
Shipments	215,595
Receipts	311,598
Total	527,193
Tonnage in calendar year ending December 31, 1905	567,713
Decrease in 1906	40,520

Principal articles shipped.—Flour, pig iron, grain, and lumber.
Principal articles received.—Coal, salt, and general merchandise.

K K 3.

IMPROVEMENT OF MENOMINEE HARBOR AND RIVER, MICHIGAN AND WISCONSIN.

Operations during the fiscal year.—The rebuilding of 1,050 linear feet of the harbor piers above the water line by hired labor, which was in progress at the beginning of the fiscal year, was completed August 11, 1906, at a cost of $6,895.74, being $6.57 per linear foot.

Condition of the improvement.—Soundings completed March 1, 1907, indicate that considerable shoaling has occurred along the northerly side of the channel between the piers, and at several other places below Ogden Street Bridge. The maximum draft which can be carried is about 19 feet.

The harbor piers are in serviceable condition, the outer portions having been recently rebuilt.

Remarks.—A report on preliminary examination, "with a view to determining whether a breakwater is necessary," as provided by section 3, river and harbor act approved March 2, 1907, was submitted April 25, 1907.

The following estimate is submitted for maintenance of channel and existing works to June 30, 1909:

For dredging 20,000 cubic yards, at 20 cents	$4,000
For minor repairs to piers	1,500
For contingencies and superintendence	500
Total	6,000

Money statement.

July 1, 1906, balance unexpended	$6,201.16
Miscellaneous receipts	1,845.14
Amount appropriated by river and harbor act approved March 2, 1907	5,000.00
	13,046.30
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	5,292.20
July 1, 1907, balance unexpended	7,754.10
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	6,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

HARBOR.

March 3, 1871	$25,000.00
June 10, 1872	25,000.00
March 3, 1873	25,000.00
June 23, 1874	25,000.00
March 3, 1875	25,000.00
August 14, 1876	8,000.00
June 18, 1878	10,000.00
March 3, 1879	10,000.00
June 14, 1880	10,000.00
March 3, 1881	12,000.00

August 3, 1882	$15,000.00	
July 5, 1884	10,000.00	
August 5, 1886	3,000.00	
August 11, 1888	9,000.00	
August 18, 1894	10,000.00	
June 3, 1896	7,150.00	
March 3, 1899	5,500.00	
		$234,650.00
RIVER.		
September 19, 1890	$54,000.00	
July 13, 1892	20,500.00	
August 18, 1894	6,000.00	
June 3, 1896	15,000.00	
March 3, 1899	18,920.00	
		114,420.00
HARBOR AND RIVER.		
June 13, 1902		50,350.00
March 2, 1907		5,000.00
Miscellaneous receipts credited to appropriations		3,514.17
Total		407,934.17

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. H. G. Thompson, deputy collector of customs, Marinette, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	114	114
Sail	105	99
Total	219	213

By way of the harbor.

	Net tons.
Shipments	89,830
Receipts	30,328
Total	120,158
Tonnage in calendar year ending December 31, 1905	165,638
Decrease in 1906	45,480

Principal articles shipped.—Lath, lumber, and railroad ties.

Principal articles received.—Coal and coke, fish, lumber, and general merchandise.

K K 4.

IMPROVEMENT OF OCONTO HARBOR, WISCONSIN.

Operations during the fiscal year.—There were no operations.

Condition of the improvement.—No material change in the condition of the improvement has probably occurred since June 30, 1902. (See Annual Report for 1902, p. 2046.)

Remarks.—It is proposed to apply the available balance in maintenance of the south pier.

Money statement.

July 1, 1906, balance unexpended	$3,645.35
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	225.00
July 1, 1907, balance unexpended	3,420.35

APPROPRIATIONS.

March 3, 1881	$10,000	August 18, 1894	$3,000
August 2, 1882	15,000	June 3, 1896	4,000
July 5, 1884	15,000	March 3, 1899	15,000
August 5, 1886	8,000	June 13, 1902	3,000
August 11, 1888	20,000		
July 13, 1892	3,000	Total	96,000

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. L. C. Harvey, secretary Business Men's Association, Oconto, Wis.]

By all ways of transportation.

	Net tons.
Shipments	403,830
Receipts	125,426
Total	529,256

Principal articles shipped.—Lumber and grain.
Principal articles received.—Brick, coal, and general merchandise.

By way of the harbor.

	Net tons.
Shipments	1,750
Receipts	3,975
Total	5,725
Tonnage in calendar year ending December 31, 1903	50,433
Decrease in 1906	44,708

Principal article shipped.—Lumber.
Principal articles received.—Hay, salt, and stone.

K K 5.

IMPROVEMENT OF GREEN BAY HARBOR, WISCONSIN.

Operations during the fiscal year.—The rebuilding of the west revetment, 620 feet in length, at Grassy Island, above the water line, was begun August 27 and completed October 11, 1906. The work was done by hired labor and purchase of materials at a cost of $4,483.35, being $7.23 per linear foot.

Condition of the improvement.—Soundings completed January 26, 1907, in the outer channel showed numerous shoals with a depth over them of less than 20 feet. Soundings completed February 6, 1907, in channel, Fox River below Depere, indicate a shoaling of from 2 to 3 feet in places since completion of the project in November, 1899.

Both revetments at Grassy Island have been rebuilt above the water line and are in good condition.

Remarks.—The project for the improvement of this harbor is completed. For restoration and maintenance of channel to June 30, 1909, the following estimate is submitted:

For dredging 40,000 cubic yards, at 20 cents	$8,000
Contingencies and superintendence	1,000
Total	9,000

Money statement.

July 1, 1906, balance unexpended	$10,107.39
Amount appropriated by river and harbor act approved March 2, 1907	5,000.00
	15,107.39
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	6,512.49
July 1, 1907, balance unexpended	8,594.90
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	9,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

June 23, 1866	$30,500.00	August 11, 1888	$10,000.00
March 2, 1867	45,000.00	September 19, 1890	10,000.00
July 25, 1868 (allotted)	17,500.00	July 13, 1892	25,000.00
April 10, 1869 (allotted)	44,550.00	August 18, 1894	25,000.00
July 11, 1870	17,500.00	June 3, 1896	25,000.00
March 3, 1871	17,500.00	July 19, 1897	5,000.00
March 3, 1873	20,000.00	March 3, 1899	28,600.00
June 23, 1874	10,000.00	June 13, 1902	105,600.00
March 3, 1875	10,000.00	June 13, 1902 (allotment from emergencies, river and harbor)	2,328.39
August 14, 1876	8,000.00	March 3, 1905	10,000.00
June 18, 1878	5,000.00	March 2, 1907	5,000.00
March 3, 1879	4,000.00	Miscellaneous receipts credited to appropriation	52.50
June 14, 1880	6,000.00		
March 3, 1881	5,000.00		
August 2, 1882	20,000.00		
July 5, 1884	10,000.00		
August 5, 1886	7,000.00	Total	529,130.89

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. M. J. McCormick, Green Bay, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	1,340	1,338
Sail	75	75
Total	1,415	1,413

By way of the harbor.

	Net tons.
Shipments	198,383
Receipts	759,096
Total	957,479
Tonnage in calendar year ending December 31, 1905	1,674,730
Decrease in 1906	717,251

Principal articles shipped.—Coal and coke, lumber, grain, and general merchandise.

Principal articles received.—Coal and coke, salt, wood, stone, and general merchandise.

K K 6.

IMPROVEMENT OF STURGEON BAY AND LAKE MICHIGAN SHIP CANAL AND HARBOR OF REFUGE CONNECTED THEREWITH, WISCONSIN.

Operations during the fiscal year.—Dredging on the shoal near Hills Point was begun May 16, 1907, and is in progress at the close of the fiscal year. The work is being done by use of the Government dredging plant. The amount dredged up to the close of the fiscal year is 51,274 cubic yards, at a cost of 9½ cents per cubic yard.

Condition of the improvement.—With the exception of about 500 feet in the vicinity of the bridge, the channel has been dredged to the full projected depth for its entire length. There are a few shoals in the dredged channel, however, the shoalest spot being about 1,800 feet easterly from the bridge in mid-channel, where the minimum depth is about 18.4 feet. The width of channel in the vicinity of Hills Point has been increased about 180 feet, and is now about 300 feet wide. Dredging now in progress will increase the channel width at this locality to about 500 feet.

For governing depth in through channel, see page 1880 of this report (Operating and care of Sturgeon Bay and Lake Michigan Ship Canal, Wisconsin).

Remarks.—On the completion of the dredging at Hills Point the existing project for a channel 21 feet deep will be completed, with the exception of about 500 feet in the vicinity of the bridge across Sturgeon Bay.

Dredging in this portion of the channel has been deferred pending arrangements with the owners of the bridge relative to removing, rebuilding, or strengthening it. The last river and harbor act, however, directs that this dredging shall be done. It is expected to complete the channel during the next fiscal year.

The funds available are sufficient for doing this work and for completing the dredging at Hills Point; therefore no appropriation is recommended.

Money statement.

July 1, 1906, balance unexpended		$62,857.70
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$2,216.83	
For maintenance of improvement	2,526.61	
		4,743.44
[illegible], 1907, balance unexpended		58,114.26

APPENDIX K K.

IMPROVEMENT OF RIVERS AND HARBORS ON THE NORTHERN AND WESTERN SHORES OF LAKE MICHIGAN.

REPORT OF MAJ. W. V. JUDSON, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Manistique Harbor, Michigan.
2. Gladstone Harbor, Michigan.
3. Menominee Harbor and River, Michigan and Wisconsin.
4. Oconto Harbor, Wisconsin.
5. Green Bay Harbor, Wisconsin.
6. Sturgeon Bay and Lake Michigan Ship Canal, and harbor of refuge connected therewith, Wisconsin.
7. Operating and care of Sturgeon Bay and Lake Michigan Ship Canal, Wisconsin.
8. Algoma Harbor, Wisconsin.
9. Kewaunee Harbor, Wisconsin.
10. Two Rivers Harbor, Wisconsin.
11. Manitowoc Harbor, Wisconsin.
12. Sheboygan Harbor, Wisconsin.
13. Port Washington Harbor, Wisconsin.
14. Harbor at Milwaukee, Wisconsin, including harbor of refuge.
15. Milwaukee Inner Harbor, Wisconsin.
16. Racine Harbor, Wisconsin.
17. Kenosha Harbor, Wisconsin.
18. Waukegan Harbor, Illinois.
19. Fox River, Wisconsin.
20. Operating and care of locks and dams on Fox River, Wisconsin.
21. Removing sunken vessels or craft obstructing or endangering navigation.

UNITED STATES ENGINEER OFFICE,
Milwaukee, Wis., July 6, 1907.

GENERAL: I have the honor to transmit herewith annual report for the works of river and harbor improvement in my charge for the fiscal year ending June 30, 1907.

Very respectfully,

W. V. JUDSON,
Major, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

K K 1.

IMPROVEMENT OF MANISTIQUE HARBOR, MICHIGAN.

Operations during the fiscal year.—No construction work has been in progress, the conditions required by act approved March 3, 1905, relative to donation of necessary land not having been complied with.

By way of the harbor.

	Net tons.
Shipments	198,383
Receipts	759,096
Total	957,479
Tonnage in calendar year ending December 31, 1905	1,674,730
Decrease in 1906	717,251

Principal articles shipped.—Coal and coke, lumber, grain, and general merchandise.

Principal articles received.—Coal and coke, salt, wood, stone, and general merchandise.

K K 6.

IMPROVEMENT OF STURGEON BAY AND LAKE MICHIGAN SHIP CANAL AND HARBOR OF REFUGE CONNECTED THEREWITH, WISCONSIN.

Operations during the fiscal year.—Dredging on the shoal near Hills Point was begun May 16, 1907, and is in progress at the close of the fiscal year. The work is being done by use of the Government dredging plant. The amount dredged up to the close of the fiscal year is 51,274 cubic yards, at a cost of 9½ cents per cubic yard.

Condition of the improvement.—With the exception of about 500 feet in the vicinity of the bridge, the channel has been dredged to the full projected depth for its entire length. There are a few shoals in the dredged channel, however, the shoalest spot being about 1,800 feet easterly from the bridge in mid-channel, where the minimum depth is about 18.4 feet. The width of channel in the vicinity of Hills Point has been increased about 180 feet, and is now about 300 feet wide. Dredging now in progress will increase the channel width at this locality to about 500 feet.

For governing depth in through channel, see page 1880 of this report (Operating and care of Sturgeon Bay and Lake Michigan Ship Canal, Wisconsin).

Remarks.—On the completion of the dredging at Hills Point the existing project for a channel 21 feet deep will be completed, with the exception of about 500 feet in the vicinity of the bridge across Sturgeon Bay.

Dredging in this portion of the channel has been deferred pending arrangements with the owners of the bridge relative to removing, rebuilding, or strengthening it. The last river and harbor act, however, directs that this dredging shall be done. It is expected to complete the channel during the next fiscal year.

The funds available are sufficient for doing this work and for completing the dredging at Hills Point; therefore no appropriation is recommended.

Money statement.

July 1, 1906, balance unexpended		$62,857.70
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$2,216.83	
For maintenance of improvement	2,526.61	
		4,743.44
July 1, 1907, balance unexpended		58,114.26

APPROPRIATIONS.

HARBOR OF REFUGE.

March 3, 1873	$40,000.00	
March 23, 1874	10,000.00	
June 18, 1878	30,000.00	
March 3, 1879	30,000.00	
June 14, 1880	10,000.00	
March 3, 1881	10,000.00	
August 2, 1882	20,000.00	
July 5, 1884	10,000.00	
August 5, 1886	5,000.00	
September 19, 1890	3,000.00	
July 13, 1892	5,000.00	
August 18, 1894	5,000.00	
June 3, 1896	5,000.00	
March 3, 1899	5,500.00	
		$188,500.00

CANAL.

July 13, 1892	$81,833.00	
August 18, 1894	20,000.00	
June 3, 1896	30,000.00	
March 3, 1899	30,000.00	
		161,833.00

CANAL AND HARBOR OF REFUGE.

June 13, 1902	$44,000.00	
March 3, 1903	178,000.00	
March 3, 1905	50,000.00	
		272,000.00
Miscellaneous receipts credited to appropriations		12,129.40
Total		634,462.40

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. Adam N. Dier, superintendent Sturgeon Bay and Lake Michigan Ship Canal, Wisconsin.]

Arrivals and departures of vessels.

Class.	From Lake Michigan to Green Bay.		From Green Bay to Lake Michigan.		Total.	
	Number.	Net tons.	Number.	Net tons.	Number.	Net tons.
1906.						
Steam	786	520,360	723	444,613	1,509	964,973
Sail	251	42,125	223	32,105	474	74,230
Unrigged	184	217,651	199	221,428	383	439,079
Total	1,221	780,136	1,145	698,146	2,366	1,478,282
1905	1,348	833,917	1,191	680,788	2,539	1,514,705
1904	1,297	716,748	1,156	631,943	2,453	1,348,691
1903	1,571	812,755	1,435	733,872	3,006	1,546,627
1902	1,708	868,961	1,592	771,753	3,300	1,640,714
1901	1,986	922,652	1,776	764,666	3,752	1,687,318
1900	1,760	749,944	1,693	684,927	3,453	1,434,871

Navigation through the canal for the season of 1906 was resumed April 10 and was practically closed December 27, a period of 262 days.

Average number of craft passing through the canal per day for the whole season (not including tugs)	9.03
Average net tons passing through the canal per day for the whole season (not including tonnage of tugs)	5,641.98
Average net tonnage of—	
Steam craft	630.47
Sail craft	156.60
Unrigged craft	1,146.38

Statement of freight and passengers carried through the canal during the calendar year ending December 31, 1906.

FROM LAKE MICHIGAN TO GREEN BAY.

Articles.	Net tons.	Articles.	Net tons.
Alum	666	Lumber	1,050
Beets (sugar)	1,100	Merchandise (general)	46,768
Cement	7,443	Oils (all kinds)	413
Coal (all kinds)	93,353	Salt	21,659
Fertilizer	150	Stone (building)	4,775
Fish	2,079	Ties (railroad)	413
Fruit	162	Tile	300
Grain (all kinds)	3,255	Wood (pulp)	3,894
Hay	165		
Iron (manufactured)	10,492	Total	198,487
Leather	350	Passengers ....number..	9,027

FROM GREEN BAY TO LAKE MICHIGAN.

Articles.	Net tons.	Articles.	Net tons.
Bark	903	Merchandise (general)	16,623
Barrels (empty)	82	Paper	1,337
Cement	603	Piles (round)	300
Coal (all kinds)	16,300	Poles (telegraph)	32,333
Dairy products	1,146	Posts (fence and paving)	1,679
Fish	227	Potatoes	410
Flour	5,477	Salt	2,286
Grain (all kinds)	15,311	Stone (building and crib)	67,686
Hay	6,085	Ties (railroad)	11,738
Hides	383	Trees (Christmas)	188
Iron (manufactured)	2,017	Wood	14,438
Iron (ore)	89,522		
Iron (pig)	2,273	Total	492,927
Logs	6,420	Passengers ....number..	8,365
Lumber	197,160		

Total number of net tons of freight carried through the canal during the calendar year ending December 31, 1906 691,414

Total number of passengers carried through the canal during the calendar year ending December 31, 1906 17,392

Statement showing quantity and estimated value of freight carried through the canal during the calendar year ending December 31, 1906.

Items.	Quantity.	Price per unit.	Total valuation.
Alum ....tons..	666	$85.00	$56,610.00
Bark ....cords..	602	8.50	5,117.00
Barrels (empty) ....number..	6,450	1.10	7,095.00
Beets (sugar) ....tons..	1,100	9.00	9,900.00
Cement ....do....	8,046	30.00	241,380.00
Coal (all kinds) ....do....	109,653	4.00	438,612.00
Dairy products ....do....	1,146	300.00	343,800.00
Fertilizer ....do....	150	25.00	3,750.00
Fish ....do....	2,306	120.00	276,720.00
Flour ....barrels..	55,330	4.50	248,985.00
Fruit ....tons..	162	70.00	11,340.00
Grain:			
Malt ....bushels..	36,863	.50	18,431.50
Oats ....do....	320,600	.40	128,240.00
Peas ....do....	207,350	1.25	259,187.50
Wheat ....do....	203,600	.85	173,060.00
Hay ....tons..	6,250	12.00	75,000.00
Hides ....do....	383	240.00	91,920.00
Iron:			
Manufactured ....do....	12,509	65.00	813,085.00
Ore ....do....	89,522	3.45	308,850.90
Pig ....do....	2,273	21.00	47,733.00

Statement showing quantity and estimated value of freight, etc.—Continued.

Items.	Quantity.	Price per unit.	Total valuation.
Leather ..... tons..	350	450.00	$157,500.00
Logs ..... M feet B. M..	2,140	25.00	53,500.00
Lumber ..... do....	132,140	30.00	3,964,200.00
Merchandise (general) ..... tons..	63,391	175.00	11,093,425.00
Oils (all kinds) ..... barrels..	2,355	9.50	22,372.50
Paper ..... tons..	1,337	60.00	80,220.00
Piles (round) ..... number..	600	6.50	3,900.00
Poles (telegraph) ..... do....	190,195	4.00	760,780.00
Posts (fence and paving) ..... do....	88,100	.20	17,620.00
Potatoes ..... barrels..	4,550	1.20	5,460.00
Salt ..... tons..	23,945	18.00	431,010.00
Stone (building and crib) ..... do....	72,461	1.10	79,707.10
Ties (railroad) ..... number..	172,603	.30	51,780.90
Tile ..... tons..	360	25.00	9,000.00
Trees (Christmas) ..... number..	15,000	.60	9,000.00
Wood ..... cords..	7,722	5.50	42,471.00
Total	.....	.....	20,340,763.40

Comparative statement of principal items of commerce through the canal for the calendar years 1905 and 1906.

Items.	Year.		Increase.	Decrease.
	1905.	1906.		
Vessels ..... number..	2,589	2,366	.....	173
Tonnage ..... tons..	1,514,705	1,478,282	.....	36,423
Tonnage (cargo) ..... do....	617,210	691,414	74,204	.....
Passengers ..... number..	14,899	17,392	2,493	.....
Bark ..... cords..	1,269	620	.....	667
Beets (sugar) ..... tons..	917	1,100	183	.....
Cement ..... do....	3,350	8,046	4,696	.....
Coal (all kinds) ..... do....	86,029	109,653	23,624	.....
Dairy products ..... do....	676	1,146	470	.....
Fish ..... do....	1,278	2,306	1,028	.....
Flour ..... barrels..	12,800	55,330	42,530	.....
Fruit ..... tons..	975	162	.....	813
Grain (all kinds) ..... bushels..	1,193,499	768,413	.....	425,086
Hay ..... tons..	970	6,250	5,280	.....
Hides ..... do....	227	383	156	.....
Iron:				
Manufactured ..... do....	19,211	12,509	.....	6,702
Ore ..... do....	25,143	89,522	64,379	.....
Pig ..... do....	2,656	2,273	.....	382
Leather ..... do....	510	350	.....	160
Lumber ..... M feet B. M..	151,293	132,140	.....	19,153
Merchandise (general) ..... tons..	66,921	63,391	.....	3,530
Oils (all kinds) ..... barrels..	6,580	2,355	.....	4,225
Paper ..... tons..	2,357	1,337	.....	1,020
Poles (telegraph) ..... number..	213,945	190,195	.....	23,750
Posts (fence and paving) ..... do....	128,406	88,100	.....	40,306
Salt ..... tons..	10,262	23,945	13,683	.....
Stone (building and crib) ..... do....	47,480	72,461	24,981	.....
Ties (railroad) ..... number..	212,771	172,603	.....	40,168
Wood ..... cords..	9,546	7,722	.....	1,824

Estimated value of freight carried through the canal during the calendar year ending December 31, 1906 ..... $20,340,763.40

Estimated value of freight carried through the canal during the calendar year ending December 31, 1905 ..... 21,034,469.40

Decrease in value of freight in 1906 as compared with 1905 ..... 693,706.00

Statement showing number and net tonnage of tugs passing through the canal during the calendar year ending December 31, 1906, and the number of vessels and unrigged craft towed during that time.

FROM LAKE MICHIGAN TO GREEN BAY.

Month.	Number.	Net tons.	Vessels towed.	Unrigged towed.
January	2	40	.....	.....
February	17	370	.....	.....
March	40	800	.....	.....
April	55	1,142	.....	7
May	52	1,212	2	8
June	40	882	2	8
July	12	225	5	3
August	21	415	2	3
September	30	859	4	9
October	17	589	5	3
November	24	475	9	7
December	18	749	1	5
Total	328	7,758	30	53

FROM GREEN BAY TO LAKE MICHIGAN.

Month.	Number.	Net tons.	Vessels towed.	Unrigged towed.
January	2	40	.....	.....
February	18	390	.....	.....
March	41	860	.....	.....
April	58	1,241	.....	10
May	57	1,286	1	14
June	39	827	1	10
July	16	303	2	11
August	22	425	1	7
September	34	954	6	12
October	16	556	4	5
November	25	714	7	4
December	18	630	3	3
Total	346	8,226	25	76

Total number of trips made through canal by tugs for whole year	674
Total number of net tons	15,984
Total number of vessels towed	55
Total number of unrigged craft towed	129
Total number of vessels and unrigged craft towed	184
Average net tonnage of tugs stationed at canal	43.25
Average number passing through canal per day for whole year	1.84
Number of tugs stationed at canal engaged in local towing	4
Tonnage of tugs stationed at the canal engaged in local towing	173
Length of towing route from harbor entrance to mouth of Sturgeon Bay, miles	8.75

Statement of class and net tonnage of vessels coming in from the lake via the canal during the year to seek shelter in Sturgeon Bay from storms.

Month.	Steam.		Sail.		Unrigged.		Total.	
	Number.	Net tons.	Number.	Net tons.	Number.	Net tons.	Number.	Net tons.
April	3	3,211	.....	.....	.....	.....	3	3,211
May	5	1,845	9	1,568	2	2,926	16	6,339
June	2	1,264	6	905	1	500	9	2,669
July	.....	.....	11	636	.....	.....	11	636
August	3	2,091	8	457	1	1,463	12	4,011
September	3	706	9	1,776	3	2,400	15	4,882
October	4	1,753	7	751	3	2,750	14	5,254
November	13	8,888	8	1,505	4	4,626	25	15,019
December	11	5,898	4	985	.....	.....	15	6,878
Total	44	25,651	62	8,583	14	14,665	120	48,899

Average net tonnage of steam craft sheltered 582.97
Average net tonnage of sail craft sheltered 138.43
Average net tonnage of unrigged craft sheltered 1,047.50

Class, quantity, and estimated value of cargoes carried by vessels while sheltered in Sturgeon Bay, season of 1906, only those coming in from the lake via the canal being included.

Items.	Quantity.	Price per unit.	Total valuation.
Beets (sugar) ..... tons..	316	$9.00	$2,844.00
Cement ..... do...	2,415	30.00	72,450.00
Coal (all kinds) ..... do...	7,900	4.00	31,600,00
Dairy products ..... do...	118	300.00	35.400.00
Fish ..... do...	325	120.00	39,000.00
Hay ..... do...	1,052	12.00	12,624.00
Iron (ore) ..... do...	6,014	3.45	20,748.30
Lumber ..... M. feet B. M..	12,197	30.00	365,910.00
Merchandise (general) ..... tons..	1,563	175.00	273,525.00
Poles (telegraph) ..... number..	20,200	4.00	80,800.00
Posts (fence and paving) ..... do....	11,000	.20	2,200.00
Salt ..... tons..	750	18.00	13,500.00
Stone (building and crib) ..... do....	2,563	1.10	2,819.30
Tile ..... do....	200	25.00	5,000.00
Wood ..... cords..	705	5.50	3,877.50

Total estimated value of cargo carried by craft sheltered $962,298.10
Total estimated value of vessels sheltered (based on Lloyd's valuation, and is approximate) 1,445,000.00

Total value of vessels and cargo 2,407,298.10

Principal lines of transportation using the canal during the past year, and number and net tonnage of boats comprising each line.

Name of line.	Port of hail.	Number of boats.	Net tonnage.
Toledo, Ann Arbor and Northern Michigan R. R. Co.	Frankfort, Mich.	4	5,736
Lackawanna Transportation Co.	Buffalo, N. Y.	2	2,860
M. A. Bradley	Cleveland, Ohio	3	4,576
James Corrigan	do	3	4,110
Lake Michigan Car Ferry Transportation Co.	Chicago, Ill.	5	5,040
Goodrich Transit Co.	Duluth, Minn	7	5,023
Edward Hines Lumber Co.	Chicago, Ill.	8	2,953
Arthur Gurley Lumber Co.	do	4	1,361
Green Bay Transportation Co.	Green Bay, Wis.	2	981
Leathem & Smith Towing and Wrecking Co.	Sturgeon Bay, Wis.	16	6,778
Sturgeon Bay Stone Co.	do	6	2,030
Total		60	41,448

Of the above lines of transportation, the Toledo, Ann Arbor and Northern Michigan Railroad Company, the Lackawanna Transportation Company, the Goodrich Transit Company, and the Green Bay Transportation Company carry both freight and passengers; the other lines freight only.

In addition to the above lines of transportation, a large number of stone barges, sail vessels, and unrigged craft engaged in the general freighting business make use of the canal continually, going both ways, during the season of navigation, and considerable local business is done by tugs engaged in assisting sail vessels, unrigged, etc., through the canal.

K K 7.

OPERATING AND CARE OF STURGEON BAY AND LAKE MICHIGAN SHIP CANAL, WISCONSIN.

Operations during the fiscal year.—Operations have been confined to work incident to operating and care, examinations, keeping record of vessels, and tonnage passing through the canal, making necessary repairs to buildings and revetments, and dredging for maintenance of channel.

During May, 1907, the Government dredge removed 2,115 cubic yards of material from "harbor of refuge" at a cost of 18¼ cents per cubic yard.

Condition of the improvement.—Navigation through the canal, opened April 10, 1906, was closed on account of ice formation January 11, 1907, and was resumed April 1, 1907. There is a depth of 21 feet below datum in the canal and in the greater part of the channel between the canal and the city of Sturgeon Bay.

The governing depth of the through channel connecting Lake Michigan with Green Bay, of which the canal forms a part, is reduced to about 15.8 feet in consequence of shoal water in the draw of the bridge that spans Sturgeon Bay.

Proposed operations.—It is proposed to apply the funds for which an allotment is requested in maintenance, operating and care, and supervision of existing works.

In accordance with the provisions of section 4 of river and harbor act of July 5, 1884, a summary of expenditures is herewith given.

Allotments from appropriation for operating and care of canals and other works of navigation (indefinite), act of July 5, 1884, applied to Sturgeon Bay and Lake Michigan Ship Canal, Wisconsin.

May 5, 1893	$1,415.83	July 19, 1901	$8,501.68
July 22, 1893	20,500.00	July 21, 1902	14,867.67
July 19, 1894	10,301.13	July 13, 1903	7,937.98
July 20, 1895	12,359.66	July 8, 1904	8,379.80
August 10, 1896	17,513.84	July 13, 1905	12,018.50
July 21, 1897	12,873.77	March 1, 1906	5,200.00
July 28, 1898	27,435.79	July 16, 1906	31,519.20
September 16, 1898	3,000.00	Miscellaneous receipts credited to appropriations	1,262.58
July 24, 1899	23,551.29		
September 19, 1899	7,500.00		
January 27, 1900	1,000.00	Total	264,654.26
July 17, 1900	37,515.54		

Summary of expenditures made from appropriation for operating and care of canals and other works of navigation (indefinite), act of July 5, 1884, applied to Sturgeon Bay and Lake Michigan Ship Canal, Wisconsin, during the fiscal year ending June 30, 1907.

Services	$12,048.17
Supplies	2,130.52
Materials	9,216.39
Miscellaneous	514.11
Total	23,909.19

CONTRACT IN FORCE.

For furnishing and delivering f. o. b. cars at mills on Pacific coast, for shipment to Sturgeon Bay, Wis., 370,112 feet B. M. fir timber and plank for use in construction and repair of piers, to be paid for as follows 12 by 12 inches by 14, 16, 18, 20, 22, 24, 28, and 30 feet, rough, at $12.50 per thousand feet B. M.; 10 by 12 inches by 24 feet, at $12.50 per thousand feet B. M., rough; 6 by 12 inches by 24 feet, rough, at $12.50 per thousand feet B. M.; 4 by 12 inches by 14, 16, and 24 feet, rough, at $12.50 per thousand feet B. M. Surfacing timber at $2.50 per thousand feet B. M.

Name of contractor: J. G. Newbegin.
Date of contract: September 4, 1906.
Time of commencement: November 4, 1906.
Time of completion: February 4, 1907; time for completion of contract waived.

K K 8.

IMPROVEMENT OF ALGOMA HARBOR, WISCONSIN.

Operations during the fiscal year.—There were no operations other than making survey of harbor preliminary to preparing new plan for improvement of the harbor, and general supervision.

Condition of the improvement.—There is a channel 12 feet deep extending from the harbor entrance to the shore end of the south pier. From there to the drawbridge the governing depth of channel is about 8½ feet. The depth at entrance is about 16 feet.

Remarks.—A plan for improving the harbor in accordance with existing project is in preparation. When it shall have been approved, it is proposed to award a contract for the entire work. The sum of $100,000, being the amount authorized in addition to the amount appropriated, should be made available for the proposed contract.

It is believed that the money appropriated and to be appropriated is sufficient for completing the existing project, and for maintenance of the north pier.

Money statement.

July 1, 1906, balance unexpended		$4,960.04
Amount appropriated by river and harbor act approved March 2, 1907		43,000.00
		47,960.04
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$934.25	
For maintenance of improvement	421.50	
		1,355.75
July 1, 1907, balance unexpended		46,604.29
July 1, 1907, outstanding liabilities		512.58
July 1, 1907, balance available		46,091.71
Amount (estimated) required for completion of existing project		100,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907, authorized in river and harbor act March 2, 1907, but not appropriated, for works of improvement		100,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

March 3, 1871	$25,000	September 19, 1890	$6,000
June 10, 1872	25,000	July 13, 1892	7,000
March 3, 1875	25,000	August 18, 1894	5,000
August 14, 1876	8,000	June 3, 1896	5,000
June 18, 1878	8,000	March 3, 1899	13,000
March 3, 1879	7,000	June 13, 1902	10,000
June 14, 1880	7,000	March 2, 1907	43,000
March 3, 1881	8,000	Miscellaneous receipts credited to appropriations	220
August 2, 1882	12,000		
July 5, 1884	15,000		
August 5, 1886	15,000	Total	249,220
August 11, 1888	5,000		

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. George R. Wilbur, mayor Algoma, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	347	347
Sail	297	297
Total	644	644

By all ways of transportation.

[About one-half of which is by way of the harbor.]

	Net tons.
Shipments	99,743
Receipts	42,924
Total	142,667
Tonnage in calendar year ending December 31, 1905	145,297
Decrease in 1906	2,630

Principal articles shipped.—Grain, cheese, veneer goods, canned peas, and general merchandise.

Principal articles received.—Coal and coke, agricultural implements, and general merchandise.

K K 9.

IMPROVEMENT OF KEWAUNEE HARBOR, WISCONSIN.

Operations during the fiscal year.—Dredging for maintenance of channel was begun April 3 and completed April 24, 1907. The work was done by hire of labor and use of U. S. dredge *No. 1*, and 11,704 cubic yards was removed at a cost of 15.4 cents per cubic yard.

Condition of the improvement.—The channel has the full projected depth of 15 feet for a width of 140 feet.

Remarks.—It being practically impossible to obtain suitable pine timber for construction and repair work, either in sufficient quantity or at a reasonable price, dependence has to be placed upon Oregon or Washington fir. The time necessarily consumed in transporting

this timber from the Pacific coast, even under the most favorable circumstances, makes it desirable to have a supply of timber available. A stock of timber is therefore being stored at Kewaunee, on land donated to the United States by the Kewaunee, Green Bay and Western Railroad Company for this purpose. The timber is being paid for out of the appropriation for improvement of Milwaukee Harbor. Reimbursement to the latter appropriation will be made from appropriations for improvement of those harbors at which the timber may be subsequently used.

A report on preliminary examination, "with a view to obtaining depths of 18 and 20 feet, respectively," as provided by section 3, river and harbor act approved March 2, 1907, was submitted April 12, 1907. The Secretary of War on May 4, 1907, authorized the preparation of plan and estimate of cost of improvement, which will be submitted at an early day.

About 450 linear feet of the south pier and 550 linear feet of the north pier are in bad condition above the water line. These portions should be cut down and new superstructure built.

The following estimate is submitted:

For rebuilding 1,000 feet of pier above the water line, at $12.50	$12,500
For dredging 10,000 cubic yards, at 15 cents	1,500
For contingencies and superintendence	1,000
Total	15,000

Money statement.

July 1, 1906, balance unexpended	$2,526.69
Miscellaneous receipts	365.25
Amount appropriated by river and harbor act approved March 2, 1907	5,000.00
	7,891.94
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,425.47
July 1, 1907, balance unexpended	6,466.47
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	15,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

March 3, 1881	$5,000.00	March 3, 1899	$8,800.00
August 2, 1882	12,000.00	June 13, 1902	11,000.00
July 5, 1884	18,000.00	March 3, 1905	3,000.00
August 5, 1886	10,000.00	March 2, 1907	5,000.00
August 11, 1888	10,000.00	Miscellaneous receipts credited to appropriations	417.44
September 19, 1890	20,000.00		
July 13, 1892	30,000.00		
August 18, 1894	20,000.00	Total	178,217.44
June 3, 1896	25,000.00		

Appropriated by local authorities in 1881 and expended by the United States under the direction of the engineer officer in charge, $8,042.72.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by the mayor of Kewaunee, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	434	434
Sail	12	12
Total	446	446

By way of the harbor.

	Net tons.
Shipments	66,927
Receipts	72,370
Total	139,297
Tonnage in calendar year ending December 31, 1905	90,325
Increase in 1906	48,972

Principal articles shipped.—Cheese, hay, grain, lumber, and general merchandise.

Principal articles received.—Coal and coke, iron and steel, and general merchandise.

K K 10.

IMPROVEMENT OF TWO RIVERS HARBOR, WISCONSIN.

Operations during the fiscal year.—Minor repairs to the revetment along the south pier were made by hire of labor and purchase of materials. The work was begun January 2 and completed January 7, 1907, at a cost of $206.49.

Dredging for restoration and maintenance of channel was begun April 16 and completed May 21, 1907, and 10,642 cubic yards were removed at a cost of $1,852.72, including cost of inspection. The work was done by Greiling Brothers, under special agreement, for 16 cents per cubic yard.

The revetment along the south pier having suffered further damage from storms since January, 1907, by reason of insufficient riprap, 975 tons of stone have been deposited, at a total cost of $1,218.75, or $1.25 per ton.

Condition of the improvement.—The channel has the full projected depth of 13 feet for a minimum width of about 160 feet.

Remarks.—The construction of the stilling basin provided for by the present project has not been commenced. The river and harbor act approved March 2, 1907, provides: "That no part of said amount shall be expended for the construction of said stilling basin until the titel to the land required for said stilling basin shall have been properly and legally conveyed to the United States Government."

The city of Two Rivers has conveyed the title to the land required to the United States, by warranty deed dated March 26, 1907. This deed, with abstract of title, was submitted for the approval of the Department of Justice, March 27, 1907, but notice of approval has not been received.

The superstructure of the crib piers, forming the outer portions of the harbor piers, is old and very much dilapidated, having been built from twenty-five to thirty years ago. It should be rebuilt at once.

The following estimate is submitted:

For cutting down and rebuilding 1,500 linear feet superstructure, at $12.50	$18,750
For contingencies and minor repairs	1,250
Total	20,000

Money statement.

July 1, 1906, balance unexpended	$1,730.82
Amount appropriated by river and harbor act approved March 2, 1907	90,000.00
	91,730.82
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	2,774.46
July 1, 1907, balance unexpended	88,956.36
July 1, 1907, outstanding liabilities	1,875.00
July 1, 1907, balance available	87,081.36
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	20,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

March 3, 1871	$25,000	August 11, 1888	$2,500
June 10, 1872	25,000	September 19, 1890	3,000
March 3, 1873	25,000	July 13, 1892	3,000
June 23, 1874	15,000	August 18, 1894	3,000
March 3, 1875	15,000	June 3, 1896	5,000
August 14, 1876	5,000	March 3, 1899	8,000
June 18, 1878	10,000	June 13, 1902	20,000
March 3, 1879	20,000	March 3, 1905	6,600
June 14, 1880	20,000	March 2, 1907	90,000
March 3, 1881	15,000		
August 2, 1882	15,000	Total	339,100
July 5, 1884	8,000		

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. J. R. Currens, mayor of Two Rivers, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	138	138
Sail	203	203
Total	341	341

By way of the harbor.

	Net tons.
Receipts	35,425
Receipts in calendar year ending December 31, 1905	38,500
Decrease in 1906	3,075

Principal articles received.—Coal and lumber.

K K 11.

IMPROVEMENT OF MANITOWOC HARBOR, WISCONSIN.

Operations during the fiscal year.—The outer end of the b water having been damaged by collision, repairs were made by ing new fender piling, protecting the damaged corner of the b water with a steel plate, and supplying additional riprap. The was begun November 9, and completed December 21, 1906, at a of $3,979.35.

Minor repairs to the decking of the south pier were made at a of $679.07.

Work under the contract with Greiling Brothers for bui 1,450 linear feet of pile pier and removing a portion of the old pier was begun May 1, 1907, and is in progress at the close c fiscal year.

Work under the continuing contract with Great Lakes Dredg Dock Company for moving cribs, building crib breakwater, rem old pier, and building pile pier was begun June 18, 1907, and progress at the close of the fiscal year.

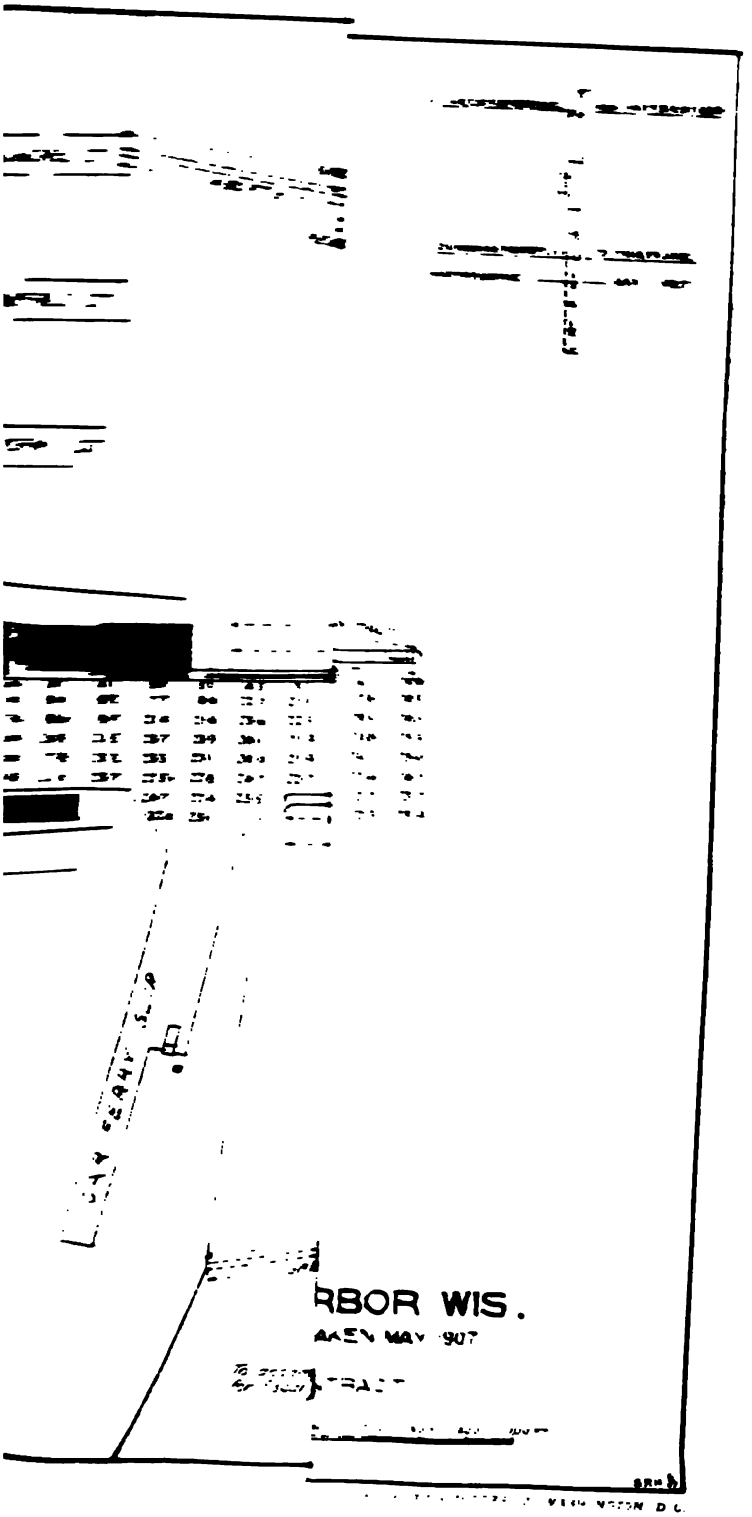
Condition of the improvement.—The entrance channel has the jected depth of 20 feet for a minimum width of about 100 feet.

Remarks.—The contracts now in force provide for the comp of the existing project. The sum of $276,000, being the ar authorized in addition to the amount appropriated, should be available for the continuing contract with the Great Lakes D and Dock Company.

It is believed that the money appropriated and to be approp is sufficient for completing the existing project and for mainte of the channel to June 30, 1909.

Money statement.

July 1, 1906, balance unexpended		$109.
Amount appropriated by river and harbor act approved March 2, 1907		100.
		209.
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$3,605.20	
For maintenance of improvement	5,609.87	
		9.
July 1, 1907, balance unexpended		200.
July 1, 1907, outstanding liabilities		
July 1, 1907, balance available		200.
July 1, 1907, amount covered by uncompleted contracts		304.
Amount (estimated) required for completion of existing project		276.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907, authorized by river and harbor act of March 2, 1907, but not appropriated, for works of improvement. Submitted in compliance with requirements of sundry civil act of June 4, 1897.		276.



Greil-
nannel,
; a cost
, begun

.96.
son for
der this

tates to

iers has
inimum

ment of
se Docu-

nends as

the land--
as soon as
er be con-

ited about
reakwater.
channel as
gth as will
nwest from
ty with the
appropria-

is shown
; in some
ommenda-

Manitowoc
oposed by

ost for this
dvisable to
provement

breakwater
n the Wave

tion, but as
oval of the
e to rebuild

K K 11.

IMPROVEMENT OF MANITOWOC HARBOR, WISCONSIN.

Operations during the fiscal year.—The outer end of the breakwater having been damaged by collision, repairs were made by driving new fender piling, protecting the damaged corner of the breakwater with a steel plate, and supplying additional riprap. The work was begun November 9, and completed December 21, 1906, at a cost of $3,979.35.

Minor repairs to the decking of the south pier were made at a cost of $679.07.

Work under the contract with Greiling Brothers for building 1,450 linear feet of pile pier and removing a portion of the old north pier was begun May 1, 1907, and is in progress at the close of the fiscal year.

Work under the continuing contract with Great Lakes Dredge and Dock Company for moving cribs, building crib breakwater, removing old pier, and building pile pier was begun June 18, 1907, and is in progress at the close of the fiscal year.

Condition of the improvement.—The entrance channel has the projected depth of 20 feet for a minimum width of about 100 feet.

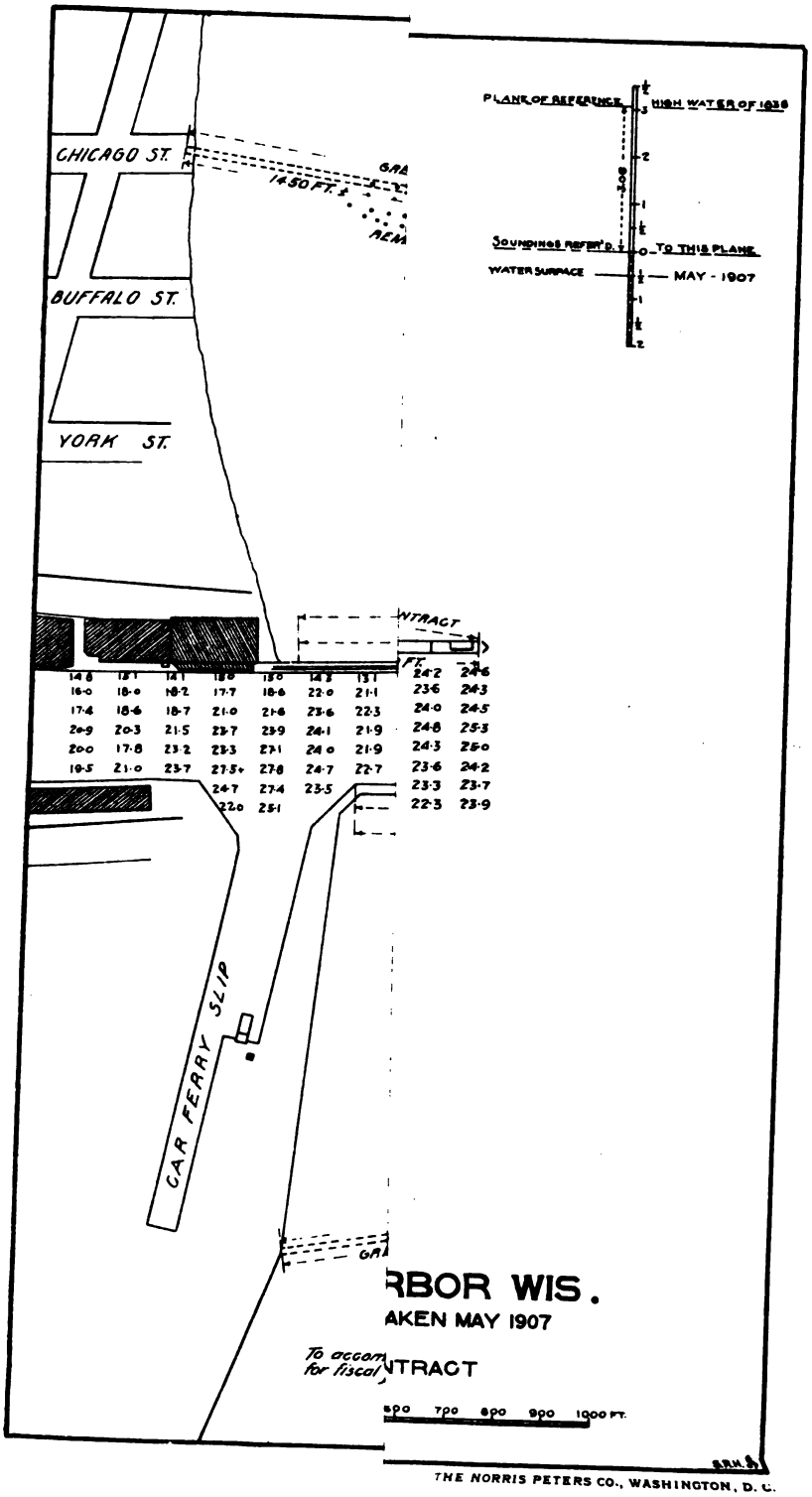
Remarks.—The contracts now in force provide for the completion of the existing project. The sum of $276,000, being the amount authorized in addition to the amount appropriated, should be made available for the continuing contract with the Great Lakes Dredge and Dock Company.

It is believed that the money appropriated and to be appropriated is sufficient for completing the existing project and for maintenance of the channel to June 30, 1909.

Money statement.

July 1, 1906, balance unexpended		$109,755.80
Amount appropriated by river and harbor act approved March 2, 1907		100,000.00
		209,755.80
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$3,605.20	
For maintenance of improvement	5,609.87	
		9,215.07
July 1, 1907, balance unexpended		200,540.73
July 1, 1907, outstanding liabilities		190.00
July 1, 1907, balance available		200,350.73
July 1, 1907, amount covered by uncompleted contracts		304,275.72
Amount (estimated) required for completion of existing project		276,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907, authorized by river and harbor act of March 2, 1907, but not appropriated, for works of improvement		276,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.



THE NORRIS PETERS CO., WASHINGTON, D. C.

APPROPRIATIONS.

August 30, 1852	$8,000.00	July 5, 1884	$15,000.00
June 23, 1866	52,000.00	August 5, 1886	15,000.00
March 2, 1867	45,000.00	August 11, 1888	8,000.00
July 25, 1868 (allotted)	17,500.00	September 19, 1890	8,000.00
April 10, 1869 (allotted)	17,820.00	July 13, 1892	28,000.00
July 11, 1870	20,000.00	August 18, 1894	20,000.00
March 3, 1871	11,000.00	June 3, 1896	44,440.00
March 3, 1873	20,000.00	March 3, 1899	3,300.00
June 23, 1874	10,000.00	June 13, 1902	45,000.00
March 3, 1875	10,000.00	March 3, 1905	110,000.00
August 14, 1876	8,000.00	March 2, 1907	100,000.00
June 18, 1878	15,000.00	Miscellaneous receipts credited to appropriations	252.72
March 3, 1879	6,500.00		
June 14, 1880	7,000.00		
March 3, 1881	4,000.00	Total	658,812.72
August 2, 1882	10,000.00		

CONTRACTS IN FORCE.

For removing old piers and building pile piers; material and labor to be paid for at the following rates: White-pine timber, at $45 per thousand feet B. M.; removing old crib piers, at $11 per linear foot; round piles, at 30 cents per linear foot; sheet piling, at $40 per thousand feet B. M.; Douglas or Oregon fir timber, at $45 per thousand feet B. M.; pine plank, at $40 per thousand feet B. M.; wrought-iron driftbolts, at 5 cents per pound; wrought-iron screw bolts and tie-rods, at 6 cents per pound; wrought-iron and wire spikes, at 6 cents per pound; stone, at $1 per ton of 2,000 pounds.

Name of contractor: Greiling Brothers.
Date of contract: August 18, 1906.
Date of approval: August 27,1906.
Date of commencement: September 29, 1906.
Date of completion: November 30, 1907.

Supplemental agreement modifying contract dated August 18, 1906, for removing old piers and building pile piers; material and labor to be paid for at the following rates: Removing old crib piers forming that portion of the present north pier, covered by original contract, at $11 per linear foot; removing old crib piers forming that portion of the north pier lying to the eastward of the portion of old north pier, covered by the original contract, at $15 per linear foot; white-pine timber, at $49.50 per thousand feet B. M.; Douglas or Oregon fir timber, at $49.50 per thousand feet B. M.; longleaf yellow or southern pine timber, at $49.50 per thousand feet B. M.; round piles, at 33 cents per linear foot; sheet piling, at $44 per thousand feet B. M.; pine plank, at $44 per thousand feet B. M.; wrought-iron or steel driftbolts, at 5½ cents per pound; wrought-iron or steel screw bolts and tie-rods, at 6.6 cents per pound; wrought-iron and wire spikes, at 6.6 cents per pound; stone, at $1.10 per ton of 2,000 pounds.

Name of contractor: Greiling Brothers.
Date of contract: March 9, 1907.
Date of approval: March 30, 1907.
Date of commencement: May 5, 1907.
Date of completion: Pile pier January 5, 1908; north pier eight months after notice that work can be done, exclusive of months of December, January, February, and March.

For moving cribs, building crib breakwater, removing old pier and building pile pier; material and labor to be paid for at the following rates:

MOVING CRIBS.

Removing and resetting 100-foot by 24-foot cribs, at $12,000 each.

BUILDING CRIBS.

Framing timber and plank to be furnished by the United States, at $10 per thousand feet B. M.; wrought-iron or steel driftbolts, at 5 cents per pound; wrought-iron or steel screw bolts, at 5 cents per pound; wrought-iron and wire spikes, at 5 cents per pound; stone, at $1.40 per ton of 2,000 pounds; foundation piles, at $20 each.

REMOVING OLD PIER AND BUILDING PILE PIER.

Removing old 24-foot crib pier, at $20 per linear foot; removing old 20-foot crib pier, at $18 per linear foot; round piles, at 33 cents per linear foot; making and driving sheet piles, plank furnished by the United States, at $15 per thousand feet B. M.; framing timber and plank furnished by the United States, at $20 per thousand feet B. M.; wrought-iron or steel driftbolts, at 5 cents per pound; wrought-iron or steel screw bolts and tie-rods, at 5 cents per pound; wrought-iron and wire spikes, at 5 cents per pound; stone, at $1.40 per ton of 2,000 pounds.

Name of contractor: Great Lakes Dredge and Dock Company.
Date of contract: May 7, 1907.
Date of approval: May 16, 1907.
Date of commencement: June 17, 1907.
Date of completion: November 30, 1908.

For furnishing and delivering f. o. b. cars at mills on Pacific coast, for shipment to Manitowoc, Wis., 1,303,092 feet B. M. fir timber and plank for use in construction and repair of piers and breakwaters; to be paid for as follows: 12 by 18 inches by 22, 24, and 30 feet, at $17 per thousand feet B. M.; 12 by 12 inches by 12, 14, 16, 18, 20, 22, 24, 26, 28, and 30 feet, at $13.50 per thousand feet B. M.; 6 by 12 inches by 14, 18, 20, 22, 24, 28, and 30 feet, at $13.50 per thousand feet B. M.; 4 by 12 inches by 16 feet, at $13.50 per thousand feet B. M.; 3 by 12 inches by 12 and 16 feet, at $13.50 per thousand feet B. M.; 3 by 12 inches by 18 and 20 feet, at $14.50 per thousand feet B. M.; 3 by 12 inches by 22 and 24 feet, at $15.50 per thousand feet B. M.; 3 by 12 inches by 26 feet, at $16.50 per thousand feet B. M.; 3 by 12 inches by 16 feet, S1S, at $14 per thousand feet B. M.; 3 by 12 inches by 18 and 20 feet, S1S, at $15 per thousand feet, B. M.; 3 by 12 inches by 22 and 24 feet, S1S, at $16 per thousand feet B. M.; 3 by 12 inches by 26 feet, S1S, at $17 per thousand feet B. M.

Name of contractor: Carstens & Earles (Incorporated).
Date of contract: March 28, 1907.
Time of commencement: April 28, 1907.
Time of completion: August 15, 1907.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by the mayor of Manitowoc, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	1,624	1,622
Sail	168	168
Total	1,792	1,790

By way of the harbor.

	Net tons.
Shipments	549,152
Receipts	653,018
Total	1,202,170
Tonnage in calendar year ending December 31, 1905	1,376,767
Decrease in 1906	174,597

Principal articles shipped.—Grain, lumber, malt, oil, and general merchandise.
Principal articles received.—Coal and coke, iron and steel, and general merchandise.

K K 12.

IMPROVEMENT OF SHEBOYGAN HARBOR, WISCONSIN.

Operations during the fiscal year.—Under the contract with Greiling Brothers for dredging for restoration and maintenance of channel, at 17 cents per cubic yard, 16,368 cubic yards were removed at a cost of $2,782.56, not including cost of inspection. The work was begun September 4 and completed November 2, 1906.

Minor repairs were made to the breakwater at a cost of $184.96.

A contract has been entered into with Burk, Smith & Nelson for extending the breakwater landward by 196 feet; but work under this contract has not yet been commenced.

About half of the timber to be furnished by the United States to the contractor for breakwater extension has been received.

Condition of the improvement.—The channel between the piers has a depth of 20 feet and a minimum width of 120 feet. The minimum depth at entrance is 22.4 feet.

Remarks.—The present project provides for the improvement of this harbor in accordance with the report submitted in House Document No. 62, Fifty-ninth Congress, first session.

In this report (see p. 16), the Board of Engineers recommends as follows:

> * * * First, that an additional length of 200 feet be given to the landward end of the existing northern breakwater, and afterwards, that as soon as funds become available, such length of a new southern breakwater be constructed as may then be found necessary.
>
> This new southern breakwater should have its lakeward end located about 300 feet due south of the lakeward end of the existing northern breakwater, should make the same angle with the axis of the existing entrance channel as does the existing northern breakwater, and should be given such length as will cause the landward end to reach or cross a line bearing south-southwest from the lakeward end of the existing south pier. Extensions in conformity with the type plan can be made from time to time as necessity arises and as appropriations become available.

On the map of Sheboygan Harbor, submitted herewith, is shown a tentative plan of improvement, which, while differing in some minor details, it is believed substantially embodies the recommendations of the board.

The plan is similar to the one adopted by Congress for Manitowoc Harbor, Wisconsin, which is a modification of the plan proposed by the Wave Action Board.

No recommendation for appropriation, or estimate of cost for this improvement is submitted at this time, as it is believed advisable to defer the adoption of any plan until the results of the improvement at Manitowoc, now in progress, shall be known.

The funds available are sufficient for extending the breakwater 196 feet landward, which is that part of the project which the Wave Action Board recommends as being of immediate necessity.

The superstructure of the harbor piers is in bad condition, but as the tentative plan of improvement provides for the removal of the greater portion of these piers, it is not considered advisable to rebuild the superstructure at the present time.

Dredging for maintenance of channel will be required annually, and minor repairs to the piers and breakwater will probably be necessary from time to time.

The following estimate for maintenance of channel and existing works for the fiscal year ending June 30, 1909, is submitted:

For dredging 40,000 cubic yards, at 20 cents	$8,000
For minor repairs to piers and breakwater	2,000
For contingencies and superintendence	1,000
Total	11,000

Money statement.

July 1, 1906, balance unexpended		$12,963.29
August 23, 1906, allotted from emergencies in river and harbor works "Restoring channel depths"		3,597.36
Miscellaneous receipts		59.71
Amount appropriated by river and harbor act approved March 2, 1907		40,000.00
		56,620.36
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$1,813.49	
For maintenance of improvement	4,900.34	
		6,713.83
July 1, 1907, balance unexpended		49,906.53
July 1, 1907, amount covered by uncompleted contracts		25,985.03
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement in addition to the balance unexpended July 1, 1907		11,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

August 30, 1852	$10,000.00	July 5, 1884	$28,000.00
June 28, 1864 (allotted)	10,000.00	August 5, 1886	15,000.00
June 23, 1866	47,598.91	August 11, 1888	15,000.00
March 2, 1867	8,000.00	September 19, 1890	15,000.00
April 10, 1869 (allotted)	14,850.00	July 13, 1892	25,000.00
July 11, 1870	15,000.00	August 18, 1894	25,000.00
March 3, 1871	15,000.00	June 3, 1896	26,000.00
June 10, 1872	18,000.00	March 3, 1899	28,400.00
March 3, 1873	10,000.00	June 6, 1900	52,000.00
June 23, 1874	10,000.00	June 13, 1902	90,000.00
March 3, 1875	12,000.00	March 3, 1905	18,000.00
August 14, 1876	6,000.00	March 3, 1905 (allotted)	3,819.21
June 18, 1878	4,000.00	March 2, 1907	40,000.00
March 3, 1879	3,000.00	Miscellaneous receipts credited to appropriations	151.34
June 14, 1880	7,000.00		
March 3, 1881	25,000.00		
August 2, 1882	30,000.00	Total	626,819.46

CONTRACTS IN FORCE.

For furnishing and delivering f. o. b. cars at mills on Pacific coast, for shipment to Sheboygan, Wis., 201,336 feet B. M. fir timber and plank for use in construction and repair of piers; to be paid for as follows: 12 by 18 inches by

20, 24, and 28 feet; 12 by 12 inches by 32, 30, 28, 26, 24, 22, 20, 18, 16, 14, 12 feet; 6 by 12 inches by 28 and 16 feet, at $12.50 per thousand feet B. M.; surfacing timber, at $2.50 per thousand feet B. M.

Name of contractor: J. G. Newbegin.
Date of contract: September 4, 1906.
Time of commencement: October, 4, 1906.
Time of completion: January 4, 1907; time for completion of contract waived.

For furnishing and delivering f. o. b. cars at mills on Pacific coast, for shipment to Sheboygan, Wis., 213,291 feet B. M. fir timber and plank for use in construction and repair of piers and breakwater; to be paid for as follows: 12 by 18 inches by 22, 24, and 30 feet, at $17 per thousand feet B. M.; 12 by 12 inches by 16, 20, 24, 28, 30, and 32 feet, at $13.50 per thousand feet B. M.; 6 by 12 inches by 18 feet, 6 by 12 inches by 20 feet, 3 by 12 inches by 18 feet, 3 by 12 inches by 16 feet, 3 by 12 inches by 14 feet, at $13.50 per thousand feet B. M; 1½ by 12 inches by 10 feet, at $13.50 per thousand feet B. M.

Name of contractor: Carstens & Earles (Incorporated).
Date of contract: March 28, 1907.
Time of commencement: April 28, 1907.
Time of completion: July 1, 1907.

For building 196 feet of crib breakwater, material and labor to be paid for at the following rates: Framing timber and plank to be furnished by the United States, at $9.20 per thousand feet B. M.; wrought-iron or steel driftbolts, at 4 cents per pound; wrought-iron or steel screw bolts and tie-rods, at 4 cents per pound; wrought-iron and wire spikes, at 5 cents per pound; stone, at $1.35 per ton of 2,000 pounds.,

Name of contractor: Burk, Smith & Nelson.
Date of contract: May 11, 1907.
Date of approval: June 6, 1907.
Date of commencement: July 6, 1907.
Date of completion: September 6, 1908.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. Theodore Dieckmann, mayor of Sheboygan, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	621	623
Sail	202	205
Total	823	828

By way of the harbor.

	Net tons.
Shipments	$13,022
Receipts	529,315
Total	542,337
Tonnage in calendar year ending December 31, 1905	436,915
Increase in 1906	105,422

Principal articles shipped.—Cheese, furniture, pease, and general merchandise.
Principal articles received.—Tan bark, coal and coke, salt, lumber, and general merchandise.

K K 13.

IMPROVEMENT OF PORT WASHINGTON HARBOR, WISCONSIN.

Operations during the fiscal year.—The outer 100 feet of the north pier was rebuilt above the water line. The work was begun November 5 and completed November 28, 1906, by hired labor and purchase of materials, at a cost of $632.75.

Condition of the improvement.—The piers, except the superstructure, are in fair condition. The channel, west basin, and, with unimportant exceptions, the north basin, have the required depth of 13 feet below datum.

Remarks.—About 400 feet of the north pier and 500 feet of the south pier, require rebuilding above the water line. These portions of the piers were built from fourteen to twenty-six years ago, and the superstructure is badly decayed. Dredging for maintenance of depth in channel and basin will be necessary.

The following estimate is submitted for the fiscal year ending June 30, 1909:

Rebuilding 900 feet of superstructure, at $12.50	$11,250
Dredging 10,000 cubic yards, at 20 cents	2,000
Contingencies and superintendence	1,750
Total	15,000

Money statement.

July 1, 1906, balance unexpended	$4,234.05
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	765.16
July 1, 1907, balance unexpended	3,468.89
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	15,000.00

APPROPRIATIONS.

July 11, 1870	$15,000.00	August 5, 1886	$5,000.00
March 3, 1871	15,000.00	September 11, 1888	5,000.00
June 10, 1872	15,000.00	September 19, 1890	3,000.00
March 3, 1873	15,000.00	July 13, 1892	6,500.00
June 23, 1874	10,000.00	August 18, 1894	5,000.00
March 3, 1875	10,000.00	June 3, 1896	5,500.00
August 14, 1876	8,000.00	March 3, 1899	4,400.00
June 18, 1878	5,000.00	June 13, 1902	6,000.00
March 3, 1879	7,500.00	Miscellaneous receipts credited to appropiations	68.25
June 14, 1880	20,000.00		
March 3, 1881	17,000.00		
August 2, 1882	17,000.00		
July 5, 1884	10,000.00	Total	204,968.25

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. Harry W. Bolens, mayor of Port Washington, Wis.]

Arrivals and departures of vessels, 1905.

	Arrivals.	Departures.
Steam	209	209
Sail	57	57
Total	266	266

By way of the harbor, 1906.

	Net tons.
Shipments	17,679
Receipts	31,775
Total	49,454
Tonnage in calendar year ending December 31, 1905	68,007
Decrease in 1906	18,553

Principal articles shipped.—Brick, coal and coke, hay, iron and steel, and lumber.

Principal articles received.—Iron and steel, fish, lumber and logs.

K K 14.

IMPROVEMENT OF HARBOR AT MILWAUKEE, WISCONSIN, INCLUDING HARBOR OF REFUGE.

Operations during the fiscal year.—Work under the contract with Mr. W. H. Gillen for construction of concrete superstructure on breakwater and north harbor pier, which was in progress at the beginning of the fiscal year, was completed September 8, 1906, and the contract closed. The work accomplished during the fiscal year was building 925 linear feet of concrete superstructure on the breakwater. The total cost of the work covered by this contract was $123,644.72, including cost of inspection, of which $63,058 was expended on the breakwater and $60,586.72 was expended on north harbor pier.

Minor repairs were made to the shore end of the south harbor pier. The work was done by hired labor and purchase of materials at a cost of $299.10.

Under a contract with Mr. J. G. Newbegin for 500,000 feet B. M., more or less, of fir timber, about 300,000 feet B. M. has been delivered. The timber is being stored at Kewaunee, Wis., as set forth in the report on that harbor. (See page 1883 of this report.)

Work under the continuing contract dated May 11, 1907, with Mr. W. H. Gillen for the construction of 3,800 linear feet, more or less, of concrete superstructure on the breakwater was begun May 20, 1907, and is in progress at the close of the fiscal year. No superstructure has been built, the work during the fiscal year consisting chiefly in

removing old timber superstructure. No expenditures except for supervision and inspection have been made under this contract.

Work under the continuing contract dated May 11, 1907, with the Edward Gillen Dock, Dredge and Construction Company for extending breakwater 980 feet was begun June 8, 1907, and is in progress at the close of the fiscal year. About 5,600 tons of stone have been deposited in the foundation for cribs, but crib construction has not been commenced. The expenditures under this contract have been for timber and inspection. The timber for crib construction is being furnished to the contractor by the United States.

Condition of the improvement.—The harbor channel has the required depth of 21 feet for a minimum width of 160 feet.

Remarks.—The contracts now in force provide for the completion of the existing project, except for rebuilding the south pier. Nothing has been done toward this latter work, and it is not expected to begin operations thereon before next year. It is believed that the money appropriated and to be appropriated is sufficient for completing the existing project and for maintenance of the channel to June 30, 1909.

The sum of $392,000, being the amount authorized in addition to the amount appropriated, should be made available for the continuing contracts now in force, and for rebuilding the south pier.

Money statement.

July 1, 1906, balance unexpended		$121,668.87
Amount appropriated by river and harbor act approved March 2, 1907		200,000.00
		321,688.87
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$444.51	
For maintenance of improvement	86,836.12	
		87,280.63
July 1, 1907, balance unexpended		234,388.24
July 1, 1907, outstanding liabilities		48.30
July 1, 1907, balance available		234,339.94
July 1, 1907, amount covered by uncompleted contracts		434,320.40
Amount (estimated) required for completion of existing project		392,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907, in river and harbor act March 2, 1907, but not appropriated:		
For works of improvement	$125,000.00	
For maintenance of improvement	267,000.00	
		392,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

STRAIGHT CUT.

August 30, 1852		$15,000.00
March 3, 1853		163.94
June 23, 1866		48,283.51
April 10, 1869 (allotted)		35,640.00
July 11, 1870		40,000.00
March 3, 1871		38,000.00
March 3, 1873		10,000.00
June 23, 1874		10,000.00
March 3, 1875		25,000.00
August 14, 1876		26,000.00
June 18, 1878		15,000.00
March 3, 1879		7,500.00
June 14, 1880		10,000.00
March 3, 1881		8,000.00
August 2, 1882		10,000.00
August 5, 1886 (from appropriation for harbor of refuge)		4,737.91
August 11, 1888		10,000.00
March 17, 1890 (special act)		6,100.00
September 19, 1890		6,000.00
July 13, 1892		14,000.00
August 18, 1894		7,000.00
June 3, 1896		7,000.00
March 3, 1899		26,000.00
Total expended at old river mouth and straight cut		429,825.36
Expended at former mouth of Milwaukee River		50,400.00
Total appropriated for straight cut (present harbor)		379,425.36

HARBOR OF REFUGE.

March 3, 1881		$100,000.00
August 2, 1882		100,000.00
July 5, 1884		85,000.00
August 5, 1886	$60,000.00	
From which allotted to Milwaukee Harbor	4,737.91	
		55,262.09
August 11, 1888		70,000.00
September 19, 1890		80,000.00
July 13, 1892		75,000.00
August 18, 1894		45,000.00
June 3, 1896		20,000.00
June 4, 1897		168,737.91
March 3, 1899		50,000.00
June 6, 1900		105,650.00
Miscellaneous receipts credited to appropriations		1,149.31
Total		955,799.31
Act of June 13, 1902 (harbor and harbor of refuge)		232,500.00
Act of March 3, 1905 (harbor and harbor of refuge)		150,000.00
Act of March 2, 1907 (harbor and harbor of refuge)		200,000.00
Aggregate		1,968,124.67

CONTRACTS IN FORCE.

For furnishing and delivering f. o. b. cars at mills on Pacific coast, for shipment to Kewaunee, Wis., 500,000 feet B. M. fir timber and plank to be used as may be needed in emergent repairs at various harbors, and to be paid for as follows: 12 by 12 inches by 14, 16, 18, 20, 22, 24, 26, 28, and 30 feet timber, at $12.50 per thousand feet B. M.; 6 by 12 inches by 18 and 28 feet timber, at $12.50

per thousand feet B. M.; 4 by 12 inches by 16 feet, at $12.25 per thousand feet B. M.; 3 by 12 inches by 16 feet, at $12.25 per thousand feet B. M.; 2 by 12 inches by 26 feet, rough, at $19 per thousand feet B. M.; 2 by 12 inches by 26 feet, S1S, at $19.50 per thousand feet B. M.

Name of contractor: J. G. Newbegin.
Date of contract: October 24, 1906.
Time of commencement: November 24, 1906.
Time of completion: July 24, 1907.

For furnishing and delivering f. o. b. cars at mills on Pacific coast, for shipment to Milwaukee, Wis., 2,120,751 feet B. M. fir timber and plank, for use in repairs and construction of piers and breakwater; to be paid for as follows: 12 by 18 inches by 22, 24, and 30 feet, at $17 per thousand feet B. M.; 12 by 12 inches by 14, 16, 20, 22, 24, 28, 30, and 32 feet, at $13.50 per thousand feet B. M.; 6 by 12 inches by 18 and 20 feet, at $13.50 per thousand feet B. M.; 3 by 12 inches by 12, 14, and 18 feet, at $13.50 per thousand feet B. M.; 1½ by 12 inches by 10 feet, at $13.50 per thousand feet B. M.

Name of contractor: Carstens & Earles (Incorporated).
Date of contract: March 28, 1907.
Time of commencement: April 28, 1907.
Time of completion: November 1, 1907.

For the construction of concrete superstructure on breakwater; material and labor to be paid for at the following rates: Removing old 24-foot superstructure and leveling cribs, at $9 per linear foot; removing old 30-foot superstructure and leveling cribs, at $9 per linear foot; pine timber, at $60 per thousand feet B. M.; wrought-iron or steel driftbolts, at 5 cents per pound; round steel bars, at 5 cents per pound; concrete blocks, at $9.50 per cubic yard; concrete in place, at $8.50 per cubic yard.

Name of contractor: William H. Gillen.
Date of contract: May 11, 1907.
Date of approval: May 21, 1907.
Date of commencement: June 22, 1907.
Date of completion: November 30, 1909.

For building cribs for extension of breakwater, material and labor to be paid for at the following rates: Framing timber and plank, the timber and plank to be furnished by the United States, at $12 per thousand feet B. M.; wrought-iron or steel driftbolts, at 4 cents per pound; wrought-iron or steel screw bolts, at 5 cents per pound; wrought-iron and wire spikes, at 5 cents per pound; stone, at $1.40 per ton of 2,000 pounds.

Name of contractor: The Edward Gillen Dock, Dredge, and Construction Company.
Date of contract: May 11, 1907.
Date of approval: June 4, 1907.
Date of commencement: July 7, 1907.
Date of completion: November 30, 1909.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. W. J. Langson, secretary chamber of commerce, Milwaukee, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	5,439	5,418
Sail	436	446
Total	5,875	5,864

By way of the harbor.

	Net tons.
Shipments	1,190,720
Receipts	5,013,304
Total	6,204,024
Tonnage in calendar year ending December 31, 1905	5,454,347
Increase in 1906	749,677

Principal articles shipped.—Beer, flour, grain, lumber, mill stuffs, provisions, and general merchandise.

Principal articles received.—Tan bark, coal, lime and cement, lumber, salt, stone, and general merchandise.

K K 15.

IMPROVEMENT OF INNER HARBOR AT MILWAUKEE, WISCONSIN.

Operations during the fiscal year.—There have been no operations during the past fiscal year.

Condition of the improvement.—The condition of the channels is believed to be practically the same as set forth in report to which reference is made in current summary.

Remarks.—The law provides that no part of the appropriation shall be expended "unless the Secretary of War shall have satisfactory assurances that the city of Milwaukee will comply with the conditions imposed upon said municipality." The necessary land has not been donated to the United States, nor have any definite assurances been offered by the city that it will comply with the other conditions imposed by Congress.

At the request of the city of Milwaukee, the Secretary of War has approved certain lines along the Kinnickinnick and lower Milwaukee rivers "as representing limiting lines of improvement ordered by river and harbor act of March 3, 1905."

The approval of these lines is preliminary to the acquirement of the necessary land by the city of Milwaukee, and it is understood that steps will be taken by the city to carry out all the conditions imposed by the law precedent to the expenditure of the appropriation, so far at least as relates to the Kinnickinnick River.

Money statement.

July 1, 1906, balance unexpended	$100,000.00
July 1, 1907, balance unexpended	100,000.00
Amount (estimated) required for completion of existing project	218,581.00

APPROPRIATION.

March 3, 1905	$100,000

K K 16.

IMPROVEMENT OF RACINE HARBOR, WISCONSIN.

Operations during the fiscal year.—Under contract with Leathem & Smith Towing and Wrecking Company, 2,124 tons of stone was deposited as riprap along the breakwater, at a cost of $2,739.96, or $1.29 per ton.

Under contract with Mr. S. O. Dixon dredging for removal of bar at harbor entrance was begun May 16 and completed May 31, 1907; 19,505 cubic yards of material was removed at a cost of $4,486.15, not including cost of inspection, or at the rate of 23 cents per cubic yard.

Condition of the improvement.—The minimum depth in mid-channel at entrance is about 21 feet, decreasing to about 20 feet at the shore end of the south pier.

Remarks.—Great difficulty is experienced in maintaining the full project depth of 21 feet at this harbor, a large amount of dredging being required annually. Notwithstanding that over 27,000 cubic yards was dredged from the channel during May and June, 1906, soundings taken April 12, 1907, showed that a bar with only about 17 feet of water over it had formed across the entrance to the harbor.

As the small dipper dredge, owned by the Government, was not available, being engaged on other work, proposals from private dredge owners were at once solicited for doing such dredging as was necessary to open the channel. Proposals were opened April 29, only two bids being received; one from S. O. Dixon for 23 cents per cubic yard, the other from the Great Lakes Dredge and Dock Company for 28 cents per cubic yard.

Although the price bid was considered high, in view of the urgency of the work, a contract, dated April 30, 1907, for dredging 18,000 cubic yards, more or less, at 23 cents per cubic yard, was entered into with Mr. S. O. Dixon, representing the C. H. Starke Dredge and Dock Company of Milwaukee, who own a large fleet of dredges.

On May 1 the steamer *C. F. Bielman*, loaded with about 3,100 tons of coal for the Racine Gas Light Company, grounded on the bar. The vessel was drawing 18 feet and was unable to enter the harbor. After being released, she proceeded to Milwaukee and discharged her cargo there.

By the terms of the contract with Mr. Dixon, the work was to begin on or before May 10; but in view of the grounding of the *C. F. Bielman*, the contractor was urged to begin work at once. He finally began dredging on May 16, and completed same on May 31, a month and a half from the time the bar was discovered.

It is believed that had there been in this district a seagoing dredge of similar type to the *Gen. Gillespie*, stationed on the east shore of Lake Michigan, the bar would have been entirely removed by April 25 at a cost not exceeding 12 cents per cubic yard (the cost of the dredging done by the Government dipper dredge in 1906), a direct saving to the Government of over $2,000, and the grounding of the *Bielman* would have been avoided.

Similar conditions to the foregoing prevail at other harbors in this district and the necessity for a seagoing dredge is becoming more and more evident each year. It is of the utmost importance to general

commerce that the full project depth shall be maintained in all harbors at all times.

In the spring of the year there is a great rush of vessels from Lake Erie ports to Lake Michigan ports loaded with coal. They pass through the Straits of Mackinaw as soon as the straits are free from ice. Under the present system it can not be insured that these vessels will find the project depth of 21 feet at each of the coal ports on Lake Michigan. Many of these vessels as a consequence are obliged to take partial loads and charge higher freight rates. Under the present system of maintenance with dipper dredges it will often be the case that bars formed during the season of navigation can not be quickly removed. It is therefore true that freight rates are frequently higher than they would be if a suitable dredge were available for insuring entrance at each port every day during the season of navigation to vessels loaded to the full draft permitted by their capacity or by the capacity of the channels between Lake Huron and Lake Erie.

Taking 1905 as a typical season, the freight rates on coal from Lake Erie ports to the principal Lake Michigan ports varied between 41½ and 46½ cents per net ton, and much higher rates were paid on coal consigned to secondary ports. It is very conservative to say that had vessels been guaranteed the full project depth every day during the season at all of the Lake Michigan ports, the average freight rates would have been reduced at least 2 cents a net ton, and the vessels would have been glad indeed to have reduced the freight that much if they could have counted upon such an advantage. Now, the amount of coal brought from Lake Erie ports to ports on the west shore of Lake Michigan during the season of 1905 was about 6,500,000 tons. If the saving on each ton of coal, due to the improved conditions which I have described above, had been 2 cents, then there would have been saved in the year 1905, $130,000. Naturally this would have been saved to the consumers of coal at the ports and in the interior throughout the State of Wisconsin. But further, any tendency to cheapen the passage of coal through Lake Michigan ports enlarges the market for coal brought in through those ports which must compete with coal brought through Lake Superior ports and with Illinois coal. It is obvious, therefore, that the more cheaply coal can be handled through Lake Michigan ports the more coal will be so handled and the greater profits will inure to the ports and the people resident thereat.

Bars at the mouths of harbors often form quickly, due to the action of a single storm or to the effect of the churning of a vessel's screw. When these bars or lumps form, unless the Government has its own plant, proposals must be solicited from contractors whose dredges are often otherwise engaged. After the contract is made, the contractor, having only a dipper dredge with scows, must await favorable weather and tow the same slowly, at some risk, to the locality of the shoal. Here, if the site be exposed to wave action, many days are lost on account of bad weather, and it may be that the bar will be an obstruction for a month or more before at great cost it can be removed.

No contractors own dredges of the sea-going hopper type, and the reason is a very obvious one. Such dredges are not suitable for doing work in the interior rivers, along dock fronts, etc.; but here the con-

tractor finds the greatest amount of his work. No dredge owned by a contractor can be exclusively employed upon United States work, and there is no other work for which the sea-going dredges are suitable. It is apparent, therefore, that if a plant is to be created which can, for example, move from one harbor to another 100 miles distant, in the course of a single night, and be ready there in the morning to remove a shoal which was only discovered the day before, the United States must procure its own plant of the sea-going hopper type.

There are several other advantages that are possessed by the dredge under consideration. In the first place, the shoals that form ordinarily are discovered before they are very serious obstructions. Perhaps the water has shoaled but 6 inches or a foot. Now, no dipper dredge can work economically against a face of but 6 inches or 1 foot. In order to secure reasonable prices it is necessary to permit the contractors to dredge against a face of from 2 to 4 feet. In other words, it is necessary, under present conditions, often to dredge deeper than one would wish at one harbor while work is waiting to be done at some other locality. But a sea-going dredge will skim off 6 inches or 1 foot at its most economical rate of working.

Again, the harbors on Lake Michigan are, many of them, open during the winter. For example, a year ago last January navigation was blocked at Muskegon, Mich., by a bar of storm or ice formation. No dipper dredge could have gone to Muskegon to do this work and the harbor would have been closed until spring, but the sea-going dredge *Gillespie* was lying at Grand Haven. She was immediately put in commission, sent to Muskegon, and in twenty-four hours had reopened the harbor.

The question of an efficient plant for maintaining the harbor entrances on the west shore of Lake Michigan can be likened to the question of maintaining a fire department in a large city. The matter to be determined is whether it would be advisable to let contracts for extinguishing the fires or to maintain a plant suitable for this purpose always ready.

The question of procuring a proper dredging plant is rather a pressing one at this time, because the plant which the United States has long had for work upon the west shore of Lake Michigan is only in part now available and even that part must, in the ordinary course of events, soon go out of commission. For the harbors on the west shore of Lake Michigan the United States constructed one dipper dredge, with scows and tug, in 1872. In 1883 this plant was duplicated, and from 1883 to 1902 both plants were available for maintaining harbors on the west side of the lake. In 1902 one of these dredges became worn out and was condemned. The other, which is now 35 years old, is still in the service of the United States, but the plant is small, old, and becoming obsolete.

The present project provides for the improvement of this harbor in accordance with the report submitted in House Document No. 62, Fifty-ninth Congress, first session.

In this report (see p. 17) the Board of Engineers recommends as follows:

To give immediate relief at this harbor, the Board recommends, first, that an additional length of 200 feet be given to the inner or landward end of the existing northern breakwater, and afterwards, that, as soon as funds become avail-

able, such a length of the outer or lakeward end of a new southern breakwater be constructed as may then be found necessary.

This new southern breakwater should commence at a point 150 feet from the axis of the existing channel and opposite the lakeward end of the northern breakwater as it now exists, and should extend at least as far as a line bearing south-southwest from the lakeward end of the existing south pier. Extensions in conformity with the type plan can be made from time to time as necessity arises and as appropriations become available.

On the map of Racine Harbor, submitted herewith, is shown a tentative plan of improvement, which, while differing in some minor details, it is believed substantially embodies the recommendations of the Board.

The plan is similar to the one adopted by Congress for Manitowoc Harbor, Wisconsin, which is a modification of the plan proposed by the Wave Action Board.

No recommendation for appropriation, or estimate of cost for this improvement, is submitted at this time, as it is believed advisable to defer the adoption of any plan until the results of the improvement at Manitowoc, now in progress, shall be known.

The funds available are sufficient for extending the breakwater 196 feet landward, which is that part of the project which the Wave Action Board recommends as being of immediate necessity.

The older portions of the harbor piers are in bad condition; but as the tentative plan of improvement provides for the removal of the greater portion of these piers, it is not considered advisable to do more at the present time than to make such minor repairs as may be necessary to keep them in fairly serviceable condition.

Dredging for maintenance of channel will be required annually, and minor repairs to the piers and breakwater will probably be necessary from time to time.

The following estimate for maintenance of channel and existing works for the fiscal year ending June 30, 1909, is submitted:

For dredging 40,000 cubic yards, at 20 cents	$8,000
For minor repairs to piers and breakwater	2,000
For contingencies and superintendence	1,000
Total	11,000

Money statement.

July 1, 1906, balance unexpended		$9,357.26
Amount appropriated by river and harbor act approved March 2, 1907		50,000.00
		59,357.26
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$100.00	
For maintenance of improvement	10,173.64	
		10,273.64
July 1, 1907, balance unexpended		49,083.62
July 1, 1907, amount covered by uncompleted contracts		9,078.32
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907		11,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

June 15, 1844	$12,500.00	July 5, 1884	$7,000.00
August 30, 1852	10,000.00	August 5, 1886	10,000.00
June 28, 1864	3,600.00	August 11, 1888	10,000.00
June 23, 1866	23,910.00	September 19, 1890	17,500.00
March 2, 1867	45,000.00	July 13, 1892	25,000.00
April 10, 1869 (allotted)	22,275.00	August 18, 1894	20,000.00
July 11, 1870	10,000.00	June 3, 1896	27,000.00
March 3, 1871	10,000.00	March 3, 1899	50,000.00
March 3, 1873	20,000.00	June 6, 1900	67,650.00
June 23, 1874	10,000.00	June 13, 1902	20,000.00
March 3, 1875	10,000.00	April 28, 1904 (allotment)	6,284.67
August 14, 1876	8,000.00	March 3, 1905	30,000.00
June 18, 1878	10,000.00	March 2, 1907	50,000.00
March 3, 1879	6,000.00	Miscellaneous receipts credited to appropriations	364.80
June 14, 1880	6,000.00		
March 3, 1881	6,000.00		
August 2, 1882	7,000.00	Total	561,084.47

CONTRACT IN FORCE.

For furnishing and delivering f. o. b. cars at mills on Pacific coast, for shipment to Racine, Wis., 398,349 feet B. M. fir timber and plank for use in construction and repair of piers and breakwater, to be paid for as follows: 12 by 18 inches by 30, 24, and 22 feet, at $15 per thousand feet B. M.; 12 by 12 inches by 32, 30, 28, 24, 22, 20, 16, and 14 feet; 6 by 12 inches by 30, 24, 22, 20, and 18 feet; 3 by 12 inches by 16, 14, and 12 feet; 1½ by 12 inches by 10 feet, at $12.75 per thousand feet B. M.

Name of contractor: Somerville Brothers.
Date of contract: June 15, 1907.
Time of commencement: August 15, 1907.
Time of completion: December 1, 1907.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by Mr. A. J. Horlock, mayor of Racine, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	1,738	1,738
Sail	78	78
Total	1,816	1,816

By way of the harbor.

	Net tons.
Shipments	17,828
Receipts	144,419
Total	162,247
Tonnage in calendar year ending December 31, 1905	141,702
Increase in 1906	20,545

Principal articles shipped.—Agricultural implements, iron and steel, wagons and carriages, and general merchandise.

Principal articles received.—Coal and coke, leather, lumber, and general merchandise.

K K 17.

IMPROVEMENT OF KENOSHA HARBOR, WISCONSIN.

Operations during the fiscal year.—Under a special agreement with Mr. S. O. Dixon, 3,650 cubic yards of material was dredged from the bar at harbor entrance, the agreed price being 20 cents per cubic yard. The work was begun November 10, and completed November 27, 1906, at a total cost of $885.25, including cost of inspection.

Condition of the improvement.—A bar with a least depth of 18.7 feet over it extends entirely across the entrance to the harbor. Inside of the bar the channel is 20 feet deep with a least width of 80 feet. Considerable shoaling has occurred in the basin, the depth over a large portion of it being from 18 to 19 feet.

Remarks.—The present project provides for the improvement of this harbor in accordance with the report submitted in House Document No. 62, Fifty-ninth Congress, first session.

In this report (see p. 17) the Board of Engineers recommends as follows:

> The Board does not consider that the present commercial interests of this harbor justify extensive improvements, and it therefore recommends that for the present its further improvement be confined to the addition of a length of 200 feet to the inner or landward end of the existing breakwater.

The funds available are sufficient for the extension of the breakwater recommended by the Wave Action Board.

The piers and breakwater are in good condition and will require only minor repairs. Considerable dredging is necessary to restore the projected depths in channel and basin.

The following estimate for the maintenance of channel and existing works for the fiscal year ending June 30, 1909, is submitted:

For dredging 30,000 cubic yards, at 20 cents	$6,000
For minor repairs to piers and breakwater	2,000
For contingencies	1,000
Total	9,000

Money statement.

July 1, 1906, balance unexpended		$20,522.53
Amount appropriated by river and harbor act approved March 2, 1907		22,000.00
		42,522.53
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$100.00	
For maintenance of improvement	2,330.71	
		2,430.71
July 1, 1907, balance unexpended		40,091.82
July 1, 1907, amount covered by uncompleted contracts		9,763.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		9,000.00

APPROPRIATIONS.

March 15, 1844	$12,500.00	July 5, 1884	$5,000.00
March 3, 1845	15,000.00	August 5, 1886	5,000.00
August 13, 1852	10,000.00	August 11, 1888	7,500.00
June 23, 1866	75,461.41	September 19, 1890	17,500.00
April 10, 1869 (allotted)	5,346.00	July 13, 1892	15,000.00
July 11, 1870	10,000.00	August 18, 1894	15,000.00
March 3, 1871	10,000.00	June 3, 1896	24,000.00
June 10, 1872	10,000.00	March 3, 1899	50,000.00
June 23, 1874	10,000.00	June 6, 1900	135,000.00
March 3, 1875	15,000.00	June 13, 1902	5,000.00
August 14, 1876	8,000.00	March 3, 1905	5,000.00
June 18, 1878	8,000.00	March 2, 1907	22,000.00
March 3, 1879	5,000.00	Miscellaneous receipts credited to appropriation	157.71
June 14, 1880	5,000.00		
March 3, 1881	5,000.00		
August 2, 1882	6,000.00	Total	516,465.12

CONTRACT IN FORCE.

For furnishing and delivering f. o. b. cars at mills on Pacific coast, for shipment to Kenosha, Wis., 425,403 feet B. M. fir timber and plank for use in construction and repair of piers and breakwater, to be paid for as follows: 12 by 18 inches by 30, 24, and 22 feet; 12 by 12 inches by 32, 30, 28, 24, 22, 20, 16, and 14 feet; 6 by 12 inches by 30, 24, 22, 20, and 18 feet; 3 by 12 inches by 18, 14, and 12 feet; 1½ by 12 inches by 10 feet, at $12.95 per thousand feet B. M.

Name of contractor: J. G. Newbegin.
Date of contract: June 15, 1907.
Time of commencement: August 15, 1907.
Time of completion: December 1, 1907.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by the mayor of Kenosha, Wis.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	266	266
Sail	78	77
Total	344	343

By way of the harbor.

	Net tons.
Shipments	6,278
Receipts	49,534
Total	55,812
Tonnage in calendar year ending December 31, 1905	72,011
Decrease in 1906	16,199

Principal articles shipped.—Bark, sand and gravel, and general merchandise.
Principal articles received.—Coal and coke, lumber, and general merchandise.

K K 18.

IMPROVEMENT OF WAUKEGAN HARBOR, ILLINOIS.

Operations during the fiscal year.—The work of rebuilding about 240 linear feet of timber superstructure on south pier, and the construction of about 1,125 linear feet of pile pier to replace a like amount of old pier, was in progress at the beginning of the fiscal year, and was completed November 30, 1906. The work was done by hire of labor, purchase of materials, and use of Government dredging and pile-driving plants, at a cost of $40,917.83.

When not employed on the reconstruction of piers, the dredge was engaged in restoring depth of channel. The total amount dredged during the fiscal year for this purpose was 9,129 cubic yards, at a cost of 21¾ cents per cubic yard.

A number of piles have been purchased, and a contract has been made with Mr. F. E. Worden for timber, to be used in continuing the new south pile pier to the shore. All the piles, 464 in number, have been delivered, and one carload of timber has been received.

Condition of the improvement.—The channel has the project depth of 20 feet for a width of about 220 feet at the outer end of the piers, diminishing to a width of about 80 feet near the shore line. The channel and basin are obstructed by several shoals, the minimum depth on which is about 19.5 feet.

Remarks.—The funds available are sufficient for rebuilding the remaining portion of the old south pier. Most of the material is now on hand, and it is proposed to complete the work during the working season of 1908; the work is to be done by hire of labor and use of Government plant.

On May 16, 1905, proposals for doing the work described as completed in 1906 were opened. The lowest bid received aggregated $68,400.56. The amount available for this work being only $55,000, it was decided to reject all bids and do the work by hired labor. The wisdom of this decision has been demonstrated, the cost of the work being much less than it would have been under contract.

Dredging for maintenance of channel and minor repairs to piers and breakwater will probably be needed from time to time.

The following estimate for maintenance of channel and existing works for the fiscal year ending June 30, 1909, is submitted:

For dredging 30,000 cubic yards, at 20 cents	$6,000
For minor repairs	2,000
For contingencies and superintendence	1,000
Total	9,000

Money statement.

July 1, 1906, balance unexpended	$48,967.51
Miscellaneous receipts	72.79
Amount appropriated by river and harbor act approved March 2, 1907	50,000.00
	99,040.30
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	30,880.36
July 1, 1907, balance unexpended	68,159.94
July 1, 1907, outstanding liabilities	7,809.19
July 1, 1907, balance available	60,350.75
July 1, 1907, amount covered by uncompleted contracts	7,600.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	9,000.00

APPROPRIATIONS.

August 30, 1852, for breakwater (outer)	$15,000.00	April 28, 1904	$5,000.00
June 14, 1880	15,000.00	March 3, 1905	30,000.00
March 3, 1881	15,000.00	March 2, 1907	50,000.00
August 2, 1882	20,000.00	Total appropriation for harbor	660,500.00
July 5, 1884	20,000.00	Appropriation for outer breakwater (1852)	15,000.00
August 15, 1886	20,000.00		645,500.00
August 11, 1888	25,000.00	Miscellaneous receipts credited to appropriations	72.93
September 19, 1890	35,000.00	Total for present harbor	645,572.93
July 13, 1892	25,000.00		
August 18, 1894	20,000.00		
June 3, 1896	20,000.00		
March 3, 1899	5,500.00		
June 13, 1902	100,000.00		
March 3, 1903	240,000.00		

CONTRACT IN FORCE.

For furnishing and delivering f. o. b. cars at mills on Pacific coast, for shipment to Waukegan, Ill., 296,784 feet B. M. fir timber and plank for use in construction and repair of piers, to be paid for as follows: 12 by 12 inches by 18 feet, at $14 per thousand feet B. M.; 6 by 12 inches by 12 and 16 feet, at $14 per thousand feet B. M.; 6 by 8 inches by 16 feet, at $13.50 per thousand feet B. M.; 4 by 12 inches by 16 feet, at $14 per thousand feet B. M.; 2 by 12 inches by 22 feet, at $16.50 per thousand feet B. M.; 2 by 12 inches by 22 feet, S1S, at $16.50 per thousand feet B. M.

Name of contractor: F. E. Worden.

Date of contract: March 25, 1907.

Time of commencement: April 25, 1907.

Time of completion: June 1, 1907; time for completion of contract waived.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Furnished by the mayor of Waukegan, Ill.]

Arrivals and departures of vessels.

Description.	Arrivals.	Departures.
Steam	935	932
Sail	5	5
Total	940	937

By way of the harbor.

	Net tons.
Shipments	2,802
Receipts	199,397
Total	202,199
Tonnage in calendar year ending December 31, 1905	206,484
Decrease in 1906	4,285

Principal articles shipped.—Fish and general merchandise.
Principal articles received.—Coal and coke, iron and steel, salt, and general merchandise.

K K 19.

IMPROVEMENT OF FOX RIVER, WISCONSIN.

Attention is invited to the report upon "Operating and care of locks and dams on Fox River, Wisconsin."

During the fiscal year ending June 30, 1907, navigation closed November 22, 1906, and reopened April 6, 1907.

Operations during the fiscal year.—The operations during the fiscal year consisted in dredging channel, upper Fox River; making slight repairs to Stockbridge Harbor; cleaning Cedars and Kaukauna canals; dredging Fond du Lac Harbor, and repairs to conveyor dredge.

Dredging upper Fox River.—Dredging was continued from a point 200 feet below mile post 45, downstream to 3,240 feet below mile post 44. These mile posts record distances above Oshkosh, measured along the channel of Fox River.

The work of redredging Fond du Lac Harbor was commenced on June 10. About 1,000 linear feet of the upper end of the channel was completed.

The canals at Cedars and Kaukauna were cleaned.

The dredging aggregates 108,041 cubic yards, at a cost of 8.5 cents per cubic yard, including repairs to conveyor dredge.

Repairs of conveyor dredge.—The first season's use of this dredge demonstrated that the two-belt rubber conveyor installed at the time the plant was constructed is impractical for the work required, by reason of the short life of the belt. The Robins system, having a

single "Balata" belt with forming rollers, was therefore substituted and a shaking feeder placed. Various other minor changes were made. It is hoped that the new belt will last three seasons, in which event the dredge will be an exceedingly efficient plant.

Money statement.

July 1, 1906, balance unexpended	$62,232.93
Miscellaneous receipts	1,392.89
Amount appropriated by river and harbor act approved March 2, 1907	35,000.00
	98,625.82
June 30, 1907, amount expended during fiscal year, for works of improvement	16,365.85
July 1, 1907, balance unexpended	82,259.97
July 1, 1907, outstanding liabilities	33.96
July 1, 1907, balance available	82,226.01
July 1, 1907, amount covered by uncompleted contracts	6,404.36
Amount (estimated) required for completion of existing project	75,866.48
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement in addition to the balance unexpended July 1, 1907	25,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

March 2, 1867, for snag boat on Wisconsin River	$40,000.00
July 10, 1870, for improving Wisconsin River	100,000.00
June 10, 1872, for purchase of works on Fox River from Green Bay and Mississippi Canal Company	145,000.00
March 3, 1873, for improving Fox and Wisconsin rivers	300,000.00
June 23, 1874	300,000.00
March 3, 1875	500,000.00
August 14, 1876	270,000.00
June 18, 1878	250,000.00
March 3, 1879	150,000.00
June 14, 1880	125,000.00
March 3, 1881	125,000.00
August 2, 1882	200,000.00
July 5, 1884	160,000.00
August 5, 1886, for improving Fox River	56,250.00
August 11, 1888, for improving Fox River	100,000.00
September 19, 1890, for improving Fox River	100,000.00
July 13, 1892, for improving Fox River	75,000.00
August 18, 1894, for improving Fox River	37,500.00
June 3, 1896, for improving Fox River	37,500.00
March 3, 1899, for improving Fox River	27,500.00
June 13, 1902	70,000.00
March 3, 1905	35,000.00
March 2, 1907	35,000.00
Miscellaneaus receipts credited to appropriations	9,170.74
Total	3,247,920.74

COMMERCIAL STATISTICS.

List of articles transported on Fox River, Wisconsin, during the season of 1906.

Articles.	Quantity.	Articles.	Quantity.
	Tons.		*Tons.*
Beer	149.00	Matches	100.00
Brick	9,339.75	Paper	28.00
Cement	624.50	Potatoes	91.50
Coal	60,155.50	Power launches	112.00
Cord wood	5,522.00	Pulp wood	24,148.00
Drain tile	111.00	Railroad ties	25.00
Flour, grain, and mill stuffs	5,841.25	Salt	1,466.00
General merchandise	21,094.00	Sand and gravel	31,152.00
Horses and cattle	8.00	Stone	4,608.50
Hay	15,827.00	Sugar	120.00
Lath and shingles	635.50		
Lime	346.75	Total	316,040.25
Logs	130,950.00	Passengers	61,592
Lumber	3,585.00		

Between Green Bay and Princeton, on various routes usually centering about Oshkosh, some half dozen stern-wheel steamboats, each of a tonnage of about 125, are employed in a general freight and passenger or excursion business. Six or eight barges and as many tugs bring coal and pulp wood up the river from Green Bay. Between 400 and 500 small yachts and pleasure craft are owned and ply upon Fox River. On page 1764, Annual Report of the Chief of Engineers for 1906, is published a list of the vessels navigating these waters.

Number of lockages on Fox River, Wisconsin, for the calendar year 1906.

No.	Lock.	Lockages.	No.	Lock.	Lockages.
1	DePere	1,407	16	Appleton second	624
2	Little Kaukauna	1,117	17	Appleton first	717
3	Rapide Croche	946	18	Menasha	1,373
4	Kaukauna fifth	882	19	Eureka	1,433
5	Kaukauna fourth	890	20	Berlin	567
6	Kaukauna third	890	21	White River	308
7	Kaukauna second	907	22	Princeton	309
8	Kaukauna first	908	23	Grand River	687
9	Little Chute fourth[a]	832	24	Montello	612
10	Little Chute third[a]	832	25	Governor Bend	569
11	Little Chute second	805	26	Fort Winnebago	1,145
12	Little Chute Guard	.....	27	Portage	101
13	Cedars	743			
14	Appleton fourth	730		Total	20,958
15	Appleton third	624			

[a] Combined.

NOTE.—The lockages for the year exceed those of the previous year by 26 per cent and 1904 by 53 per cent, indicating a constant and rapid increase of traffic. This is due to some extent to the rapid increase in the number of small power pleasure boats.

K K 20.

OPERATING AND CARE OF LOCKS AND DAMS ON FOX RIVER, WISCONSIN.

Under an allotment from the indefinite appropriation for operating and care of canals and other works of navigation there has been expended during the year ending June 30, 1907, the sum of $104,565.07.

The work accomplished has been dredging bars and channels; making repairs of locks, dams, canal banks, dredges and boats, etc., as given below.

DePere lock.—The tripod platforms were leveled up and decayed spars were replaced. The platform and walk in front of office was repaired. Wire fences were built across the canal banks above the lock.

DePere dam.—Decayed timber in abutment cribs of sluiceways and the walk connecting same was renewed.

Little Kaukauna lock.—Slight repairs were made to the tripod platforms and decayed spars replaced.

Little Kaukauna dam.—Decayed timber in the sluiceway abutments and walk leading to same was replaced and the crest was leveled up and repaired.

Rapide Croche lock.—Slight repairs were made to the old lower gates in 1906, and in 1907 these gates were replaced with new gates of solid fir timber with new ironwork.

Rapide Croche lock house.—This house, commenced during the last fiscal year, was completed September 25, 1906, after which a wire fence inclosing the lock house site, a tract 150 feet square, was built.

Rapide Croche dam.—Decayed timber in walk over sluiceways and crest was renewed and horses in sluiceway repaired; other slight repairs were made.

Kaukauna fifth lock.—The valve stops were repaired.

Kaukauna fourth lock.—Decayed plank in valve platform was renewed and minor repairs made. The banks of the wasteweir ditch were sloped and paved with stone for a distance of 110 linear feet.

Kaukauna third lock.—Decayed planking in the valve platform was renewed, and minor repairs.

Kaukauna second lock.—The lower tripod platforms were raised and leveled.

Kaukauna first lock.—The bulkhead in which the filling valves are situated was rebuilt.

Kaukauna dam.—The walk from left abutment, to and across the sluiceways, was repaired.

Kaukauna guard lock.—The top arms of the gates were repaired.

Kaukauna canal.—The left bank of the canal, from the fourth lock to the old quarry dock, was paved with stone. The right bank of the canal above Wisconsin Avenue Bridge was raised and leveled up. A break which occurred in this bank on May 30, 1907, was repaired; for forty-eight hours navigation was suspended.

Little Chute combined locks.—Four broken gears in valve-maneuvering apparatus of middle gates were repaired, and minor repairs.

Little Chute second lock.—Four broken gears in maneuvering apparatus were replaced. The action of frost moved several stones in the bottom courses of lock wall, and dowel pins were placed in the bed rock to prevent further action of frost. Minor repairs.

Little Chute dam.—Timber was purchased for repairs of this dam, the repairs to be made during low water.

Cedars lock house.—The lock house was raised and placed on a stone foundation, with a cellar under a part of the building. A porch was built across front end of house. The lock house site was inclosed by wire fence.

Rebuilding Appleton fourth lock.—This lock was originally built by the Fox and Wisconsin Improvement Company prior to 1870. It was rebuilt by the United States in 1884, and again in 1894, and was composed of dry rubble masonry, faced with timber and plank. The new lock was lengthened 9.8 feet upstream to the regulation length of 170 feet between hollow quoins, and the walls have been raised 1½ feet. New gates of solid timber were provided and operated with steel spars and tripods. The lock rests upon bed rock, which had previously been excavated to a depth of about 3.5 feet to obtain the required depth.

Immediately after the close of navigation, on November 22, 1906, cofferdams were thrown across the canal, the lock was pumped out, and the old lock was then removed. The new lock was completed and water admitted on May 2, 1907. The lock walls are composed of rubble masonry, faced with cut stone, and are 21.4 feet high, 10½ feet wide on the bottom, and 4½ feet wide on top. The valve platform consists of 12-inch I beams extending across the full width of the chamber and supported through the center by a masonry wall containing three arches. The space between the I beams is filled with concrete, reinforced with iron bars and expanded metal. The filling valves are placed in openings between I beams. The miter sills are also made of steel channels and I beams, the space between the members being filled with concrete. This platform is a new design to supplant the old wooden platforms, which require frequent repairs, and is considered a very successful and economic structure. The filling valves were provided with improved maneuvering gears, let into a recess in the coping of the walls and covered with steel floor plates, presenting a smooth surface to the lock walls.

Appleton Fourth lock house.—The house was raised about 3 feet to bring the floor above the top of the lock wall. The stone foundation was then built up and new window and door frames and a new outside cellar stairway were provided. A hard-maple floor was laid in one room.

Revetting canal bank below Appleton lower dam.—The river side of the canal bank at this place having been badly washed by action of the water, due largely to a breakwater built in the river by the Green Bay and Mississippi Canal Company, a dry stone wall was laid along the foot of the slope from the wall below the right abutment of the dam to a point opposite the lower end of the Fourth lock, a distance of 678 feet. The wall is 7 feet high, 3 feet wide on top, and 3½ feet wide on the bottom, at the upper end, and 9⅓ feet high, 3 feet wide on top, and 4⅔ feet wide on the bottom at the lower end. The cost of this work to the United States, $2,771.94, which includes $54.33 not yet paid for, was repaid to the appropriation for operating and care of canals, etc., allotment for Fox River, by the Green Bay and Mississippi Canal Company.

Appleton lower dam.—The guard cribs on left side of channel above dam were rebuilt above water and fender timbers placed between the cribs. The track and walk over sluiceways were repaired. The maneuvering apparatus for the gates was modified to enable the operator to handle them more easily.

Appleton Third lock.—Defective coping stone was replaced with new stone.

Appleton Second lock and house.—Slight repairs were made to masonry at the lower end of the lock. Minor repairs.

Basin above Lake street, Appleton.—On September 29, 1906, a valuable piece of property lying above Lake street and adjoining the left bank of the canal, which had been for many years occupied by the Green Bay and Mississippi Canal Company, was taken possession of by United States employees, under the orders of the district officer. A temporary fence was built around the property and the old warehouse situated on the canal bank was razed. Two small tracts of this property has since been sold to parties who were occupying them under lease from the canal company.

It is proposed to use a part of this property, as was originally contemplated, by the Fox and Wisconsin Improvement Company, to enlarge the canal and form a turning basin and boat landing. It is also proposed to transform the old dwelling house standing on the property into a freight and passenger shelter. Preparatory to making the basin, a dredge cut was made along the left bank for a distance of 200 feet and the material was placed on the bank to be used for the new canal bank.

Appleton First lock.—The bulkhead in which the filling valves are situated was rebuilt. The timber frame supporting the lower left tripod platform was replaced with a dry rubble wall filled with earth. A dry wall was built back of the upper left tripod platform and backed up with earth. Other minor repairs were made.

Appleton upper dam.—The two wooden Taintor sluice gates remaining were replaced with new gates made entirely of steel. The hoisting apparatus for the sluice gates was modified to enable the operator to handle it more easily.

Menasha lock and house.—Snubbing posts were placed above and below the lock. Overhanging trees along the canal banks were cut. A hard-maple floor was laid in one room of lock house.

Menasha dam.—Sluice gate No. 5 was repaired where injured by a crib passing through the gate and to replace decayed timber.

Eureka lock house and canal.—A hard-maple floor was laid in the kitchen and pantry and the porch was repaired; the plastering in kitchen was repaired and that in three rooms was cleaned and painted; the right bank of canal above lock was sloped and paved with stone where necessary.

Berlin lock house.—The cellar stairway and the platform on west side were rebuilt. The partition between sitting room and hallway was removed, the plastering was repaired, and three rooms were cleaned and painted; the chimney was rebuilt. The runway from lock to warehouse was rebuilt.

White River lock.—The right bank of the river above the lock was sloped and paved with stone and protected with brush mats for a distance of 300 feet. Willows were then planted along the bank.

Princeton lock house.—The chimneys were repaired.

Grand River lock.—The work of building concrete tripod platforms, commenced during the last fiscal year, was completed. The fence along the road from lock to highway was repaired.

Montello lock and dam.—Slight repairs were made to the lock, and timber was purchased for the repairs of the dam.

Dredging bars and channels.—To maintain a navigable channel and restore it to dimensions heretofore obtained bars were removed on the Fox River at different places. The work accomplished was done by dredges Nos. 4 and 5, and the new conveyor dredge, and aggregates 50,148 cubic yards at a cost of $4,391.96, or about 5 cents per cubic yard on upper river and 35 cents per cubic yard on lower river.

Special repairs to plant.—The work of building a new hull and crane for dredge *No. 4*, commenced during the fiscal year, was completed August 25. Two new side-dump scows, each 70½ feet long, 18 feet wide and 5 feet 2 inches deep, with a capacity of about 75 cubic yards, were built by contract and completed June 12, 1907. Material for the repairs of steam tug *Wolf*, barge *Princeton*, and scow *Eureka* was purchased, but received too late to permit the work to be done.

Repairs of boats and dredges.—Numerous minor repairs were made to boats and dredges.

An itemized statement of the expenditures during the year, required by section 4, river and harbor act of July 5, 1884, is appended hereto.

List of allotments from appropriation for operating and care of canals and other works of navigation (indefinite), act of July 5, 1884, applied to Fox River, Wisconsin.

August 9, 1884	$54,000.00	January 6, 1900	$2,000.00
July 28, 1885	42,304.00	May 29, 1900	6,362.54
July 20, 1886	43,668.00	July 20, 1900	78,167.11
July 13, 1887	43,650.00	August 10, 1900	6,238.40
June 28, 1888	48,900.00	July 19, 1901	54,563.57
June 12, 1889	62,760.00	July 21, 1902	68,397.51
November 25, 1889	13,500.00	October 4, 1902	2,750.00
June 19, 1890	69,005.00	July 18, 1903	48,776.32
April 28, 1891	63,980.00	July 8, 1904	31,117.60
July 1, 1892	40,000.00	July 13, 1905	53,604.16
July 15, 1893	32,430.55	July 17, 1906	82,432.33
July 26, 1894	30,882.37	September 27, 1906	3,000.00
July 20, 1895	61,279.63	June 11, 1907	5,000.00
October 6, 1896	62,665.03	Miscellaneous receipts credited to appropriations	3,139.90
July 30, 1897	60,009.62		
July 29, 1898	63,869.10		
October 4, 1898	3,000.00		
July 22, 1899	72,911.29	Total	1,314,364.03

Summary of expenditures made from appropriation for operating and care of canals and other works of navigation (indefinite), act of July 5, 1884, applied to Fox River, Wisconsin, during the fiscal year ending June 30, 1907.

Services	$50,043.68
Supplies	2,185.58
Materials	50,623.92
Miscellaneous	1,711.89
Total	104,565.07

Wrecks in Kewaunee Harbor, Wisconsin.—Five wrecks of vessels lying within the established harbor lines of Kewaunee, Wis., having obstructed navigation for a period longer than six months, were removed by the United States under the provisions of section 19, river and harbor act of March 3, 1899. The wrecks removed are as follows: Tug *James N. Brooks;* schooner *Edith H. Koyen;* schooner *Exchange;* barge *Liberty;* small unknown vessel.

The work was done by Mr. Charles Metzner, Kewaunee, Wis., under an emergency contract dated October 30, 1906, at a total cost of $141, and was paid for from an allotment from appropriation for removing sunken vessels or craft obstructing or endangering navigation, indefinite. The work was completed November 22, 1906.

Detailed statement of expenditures, etc.—Continued.

Character of work, etc.	Item of expense.	Amount.	Total.
General repairs to plant, boats, dredges, machinery, etc.—Continued.	Repairs of flat scow No. 4	$20.31	
Do	Repairs of barge Princeton	42.37	
Do	Repairs of dump scow No. 2	55.87	
Do	Conveyor dredge	193.34	
Do	Pontoon scow No. 1	64.00	
Do	Material	355.13	
Do	Labor and transportation	102.17	
			$2,684.12
General repairs to locks, dams, and canal banks	Materials	3,350.08	
Do	Labor and transportation	2,713.70	
			6,063.78
Care of works and property	Traveling expenses of assistant engineers, etc.	309.22	
Do	Fuel for tugs Fox and Wolf	383.71	
Do	Watchman, labor, and transportation.	2,598.05	
Do	Furniture for Oshkosh office	34.00	
			3,324.98
Maintenance of navigation	Lock masters' services	7,782.50	
Do	Gage observers' services	60.00	
			7,842.50
Superintendence and contingencies	Salary of assistant engineer	2,000.00	
Do	Salary of junior engineer	1,500.00	
Do	Salary of superintendent	1,650.00	
Do	Salary of clerks, etc	2,765.00	
Do	Mileage of officers	146.40	
Do	Rent of telephones and tolls	250.27	
Do	Telegrams	10.16	
Do	Rent of post-office box, Oshkosh.	2.50	
Do	Rent of office, Oshkosh	440.00	
Do	Stationery	375.22	
Do	Blueprint paper	16.92	
Do	Typewriter, Oshkosh office	92.25	
			9,248.72
Total			104,565.07

K K 21.

REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

Wreck of tug J. W. Bennett in Green Bay, Wisconsin.—On August 18, 1906, the steam tug *J. W. Bennett* was sunk in collision with the steamer *Saugatuck* in Green Bay, Wisconsin. The tug sunk in about 32 feet of water at a point NE. ½ N. and about 11½ miles distant from Tail Point light station, on the regular sailing course between Sturgeon Bay and Green Bay.

An examination showed that there was less than 18 feet of water over the wreck and that it was a dangerous obstruction to navigation.

Several attempts to remove the wreck were made by its owners, Nau's Tug Line, of Green Bay, Wis., who finally, on October 13, 1906, formally abandoned it.

The wreck was removed by the United States under an emergency contract entered into November 13, 1906, with the Leathem and Smith Towing and Wrecking Company at a total cost of $443; which was paid for from an allotment from appropriation for removing sunken vessels or craft obstructing or endangering navigation, indefinite. The work was completed May 31, 1907.

Under a contract with the Jackson & Corbett Company, approved July 28, 1906, work on the concrete superstructure of the North Pier was commenced July 24, 1906, and continued throughout the year, except while stopped by winter weather, from December to May. About 400 linear feet of the old superstructure over the North Pier was removed, and a foundation for the new superstructure practically completed over this entire length; a new 30-foot crib was sunk in place at the west end of the pier and filled with stone; 2 clumps of piles were driven at the westerly end of the pier, and 77 concrete blocks were made. This contract is about 21 per cent completed.

This pier superstructure work progressed much more slowly than anticipated, the difficulties being explained by the following extracts from the annual report of the Assistant Engineer:

The old superstructure was in a deplorable condition, caused by a number of collisions with vessels, by accidental fires on several occasions, and by natural decay; and when the original substructure (crib work) was reached, this was found to be, to a great extent, in as bad, if not worse, condition * * *.

The west 60 feet of the crib work was known, prior to the letting of the contract, to be entirely unfit for repairs, and provisions were therefore made in the specifications for the entire removal of this crib, which had been sunk on the sand bottom in 1867, and a new crib was provided to take its place. The adjoining cribs were cut down in some cases to depths of 7 and 8 feet below city datum. The mode adopted for the preparation of the foundation on these cribs was as follows: Cribs Nos. 2 and 3, of a combined length of 74 feet, were cut down to depths varying between 3 and 8 feet; sheet piling was driven on both sides of the cribs and held together with wales and tie-rods, after which a support for the timbers forming the foundation for the concrete blocks was made with bags of No. 1 concrete placed in layers along each side of the crib, the middle part being filled with rubblestone and gravel.

Cribs Nos. 4 to 8, inclusive, a combined length of 250 feet, were not so badly damaged. The dovetails were, however, in many parts of these cribs so badly worn as to be devoid of sufficient power to hold the side walls together; the method used to remedy this was to drive piles in pairs on opposite sides of the cribs and connect these opposite pairs with tie-rods through waling pieces on the outside, after which the timber work was built up to the required level. This low-level work was completed for a distance of 127 feet, and partly so for 130 feet more, on December 15, 1906, at a total cost of $14,065.63; but it is expected that more work of this kind will be found necessary on the work further out.

The rubblestone in the old superstructure has been used in filling the new crib, and will be used as riprap around the clumps of piles and along the sides of the pier.

The construction of concrete blocks began on August 22, and 48 blocks were made. These were placed on the work in December, but with the understanding that they were not accepted, but would be allowed to be so placed to serve as a protection to the completed part of the foundation over winter. Two clumps of piles were placed at the westerly end of the pier, but they have not as yet been accepted, as the riprap has not been completed. The new crib was sunk on pile foundation on October 4, 1906.

* * * Owing to almost incessant northeasterly winds for about 5 to 6 weeks in the spring, no work could be done on the pier and caused to a great extent the lateness in resuming operations.

During April, 1907, soundings were commenced at the river entrance and in the outer basin, to ascertain the amount of dredging to be done under the new appropriation.

The field work has been carefully looked after by Assistant Engineer G. A. M. Liljencrantz.

The piers and breakwaters (except at the places to be replaced with rete superstructure as indicated above) are generally in fair con-, though somewhat decayed in spots. Being constructed of n cribs ballasted with stone, their superstructure must in course e be entirely rebuilt, but for the present the repair work will be

merely such as is made necessary by accidents and storms. The South Pier is in reasonably fair condition, though some of the decking is torn off and some of the top side timbers and ties are broken. The easterly and southerly breakwaters will need extensive repair before long. The superstructure and decking are considerably decayed and badly broken up in many places and should be replaced by concrete superstructure within a few years. The exterior breakwater is also decayed in scattered places, but might be repaired so as to last for several years. Soundings were taken in April, 1907, at the main entrance to the harbor, in the outer basin, and at the approach to it in the lake opposite the gap between the easterly and southerly breakwaters. These soundings indicate that there is a good channel with not less than 20 feet depth at the main harbor entrance, except along the sides; that some shoaling has occurred in the north part of the basin, which was dredged in 1902, and that the approach to the southerly entrance to the basin has only a depth of from 16 to 18 feet for a distance of about 1,800 feet east of the breakwater.

Surveys made during 1906 develop the need of considerable redredging just outside the southern entrance to the outer basin. This work will properly come under the head of maintenance and will be treated accordingly.

Money statement.

July 1, 1906, balance unexpended		$168,015.94
Amount appropriated by river and harbor act approved March 2, 1907		250,000.00
		418,015.94
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$51,795.84	
For maintenance of improvement	25,360.51	
		77,156.35
July 1, 1907, balance unexpended		340,859.59
July 1, 1907, amount covered by uncompleted contracts		72,782.73
Amount (estimated) required for completion of existing project		44,960.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$44,960.00	
For maintenance of improvement	10,000.00	
		54,960.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

July 11, 1870	$100,000.00	July 13, 1892	$72,000.00
March 3, 1871	100,000.00	August 18, 1894	80,000.00
June 10, 1872	90,000.00	March 3, 1899	100,000.00
March 3, 1873	90,000.00	March 3, 1905	200,000.00
June 23, 1874	75,000.00	March 2, 1907	250,000.00
March 3, 1875	78,000.00		
August 3, 1876	5,000.00	Total appropriated	2,360,000.00
June 18, 1878	75,000.00	Received from all sources since 1870 (transfer of tugs, sales, etc)	936.46
March 3, 1879	75,000.00		
June 14, 1880	145,000.00		
March 3, 1881	150,000.00		
August 2, 1882	200,000.00	Total appropriated	2,360,936.46
July 5, 1884	100,000.00	Transferred to Chicago River	25,000.00
August 5, 1886	75,000.00		
August 11, 1888	200,000.00		
September 19, 1890	100,000.00		2,335,936.46

CONTRACTS IN FORCE.

Name of contractor: Great Lakes Dredge and Dock Company, Chicago, Ill.
Amount and character of work: 857,143 cubic yards—dredging.
Price per cubic yard: 10.5 cents.
Date of approval: August 31, 1905.
Date for beginning of work: September 5, 1905.
Date for expiration: June 30, 1906. (Extended June 13, 1906, for a reasonable period.)

Name of contractor: Jackson & Corbett Company, Chicago, Ill.
Character of work: Removing and replacing superstructure, North Pier, by concrete superstructure, etc. Total, about $60,000.
Price per unit: For removing 1 crib, 50 by 30 by 19 feet, $2,500; replacing 1 new crib, 30 by 30 by 20½ feet, $5,500; removing other old superstructure and leveling other cribs, $4 per linear foot; white-oak timber, $55 per 1,000 feet, pine timber, $50 per 1,000 feet; white-oak piles, $16.65 each; Norway pine piles, $16.65 each; screw bolts, tie-rods, turn-buckles and anchor rods, 7 cents per pound; driftbolts, 4 cents per pound; T-rails, with bolts, 3½ cents per pound; channel irons, 3½ cents per pound; staples, 6 cents per pound; manhole covers, with frames, etc., $8 each; wrought-iron pipes, $1; wrought-iron gates, with frame, lock, etc., $150 each; wire rope, 20 cents per linear foot; riprap stone (new, if required), $5 per cord of 128 feet; broken stone and gravel filling (floor of passageway), $2.25 per cubic yard; concrete blocks (No. 1 concrete), $7.10 per cubic yard; concrete in mass (No. 1 concrete), $7.50 per cubic yard; concrete in mass (No. 2 concrete), $5.25 per cubic yard.
Date of approval: July 28, 1906.
Date for beginning of work: August 30, 1906.
Date for expiration: February 28, 1907. (Extended February 15, 1907, for a reasonable time.)

COMMERCIAL STATISTICS.

Receipts and shipments by lake at Chicago, Ill., during calendar year 1906.

Receipts.	Quantity.	Shipments.	Quantity.
	Tons.		*Tons.*
Coal	627,175	Flour	220,760
Salt	194,169	Wheat	148,560
Iron ore	199,396	Corn	831,522
Cement	67,444	Oats	88,729
Lumber	803,450	Rye	6,999
Shingles	3,633	Barley	4,203
Lath	499	Flaxseed	10,317
Posts	19,866	Grass seed	3,236
Railroad ties	59,721	Mill stuffs	107,934
Poles	53,749	Malt	9,786
Wood	16,044	Oil cake	49,902
Copper	3,858	Broom corn	621
Sugar	197,428	Lard	472
Green fruits	146,225	Tallow	4,023
Wheat	10,092	Pork	696
Rye	560	Beef	23
Flaxseed	10,500	Hides and leather	161
Unclassified	696,995	Oil	2,487
		Sugar	3,125
		Wool and hair	53,664
		Unclassified	353,762
Total	3,110,804	Total	1,900,982

Comparison of receipts and shipments for years 1897 to 1906, inclusive.

Year.	Tons.	Year.	Tons.
1897	7,149,759	1902	5,184,792
1898	7,391,454	1903	6,105,553
1899	6,189,365	1904	4,446,071
1900	5,873,070	1905	5,388,986
1901	6,184,242	1906	5,011,786

L L 2.

IMPROVEMENT OF CHICAGO RIVER, ILLINOIS.

For general description of original condition of river, its projects, and general results, see summary, page 626.

Under the contract approved March 1, 1905, with the Chicago and Great Lakes Dredge and Dock Company, for the construction of two turning basins, one in the North Branch, the other in the South Branch of the river, 86 per cent of the work contracted for had been completed at the beginning of the fiscal year. The remaining work, which was the completion of the docking of the South Branch basin and some redredging in the same basin, so far as originally planned, was completed October 23, 1906; the work of the year being at the turning basin, South Branch, under contract No. 1, 542.5 linear feet of dock was built at the southeasterly boundary, shallow places in the basin were redredged, and 34,006 cubic yards of material was removed, completing all dock construction and dredging under this contract.

The cost of the turning basins was as follows:

Dredging, 736,519 cubic yards, at $0.1275	$93,906.18
Dock construction, 1,146.4 linear feet	26,205.56
Removal of old lock wall	1,340.00
Land for basins proper	309,290.96
Appraising of land and expert testimony	4,075.00
Abstracts, recording and copying	1,356.74
All other expenses up to completion of contract, including inspection, superinendence, etc	18,684.17
	454,858.61

When the required land was secured for the North Branch turning basin, tract No. 1 consisted of lots 1 to 5, inclusive, and all of lot 6, except a small triangle at the west end thereof, of block 35 of Elston's addition to Chicago; but the owner of the land, offering to convey at the appraised valuation per square foot, provided that the whole of lot 6 was taken, a compromise was agreed to on that basis. Later the owner found use for the parcel of lot 6 in question, and on his application the Secretary of War issued a deed for the same, under date of December 7, 1903, for a consideration of $1,096, with a proviso that the owner should build a dock in front of this land, which fronts on the turning basin, within one year of the completion of this basin. This provision was complied with in February, 1907. The money received from the sale of this piece of land and of buildings and soil has been excluded from the sum given above as representing the cost of land for the basins.

But since these areas were originally dredged, considerable filling has occurred by drift from the upstream parts of the river, and considerable redredging will be necessary; moreover, it is now considered best to extend the docking around the undocked parts of the basin on the Government front, to prevent caving banks and consequent dredging. This work will be treated as maintenance and executed when necessary. (See p. 1975, Annual Report, 1906.)

At the turning basin, North Branch, slight shoaling having occurred, the basin was resounded during July, 1906; but as its depths

were found to be greater than those of the adjoining river, above and below, no redredging of the basin seems useful or desirable at the present time. Soundings were commenced in April and completed in May, between Rush Street Bridge (near the mouth of the river) and the junction of the two branches, to ascertain the amount of dredging to be done in the Main Branch of the river under the new appropriation.

Projects and specifications for work under the March 2, 1907, appropriation are under preparation.

On June 26, 1907, at 8.30 p. m., the steam barge *Atlas*, loaded with sand, struck the south abutment of Clark Street Bridge in the main river and sank in such way as to block navigation in the south draw. The owner, after making unsuccessful efforts to remove the wreck, has abandoned it, and steps will be taken at once to remove it at the expense of the United States.

By outside parties, but under War Department permits or orders, involving supervision by this office, special work has progressed as follows:

Tunnels under Chicago River.—For the history of this matter reference is had to the Annual Report of the Chief of Engineers for 1905, pages 2069, 2073 to 2109, inclusive; Annual Report, 1906, pages 1774-1775, and to the present summary, page 627.

At the commencement of the year the status of this work was that nothing had been actually done, although the War Department requirements were that the tunnels should be so altered that there should be a depth over them of at least 22 feet, and that the alterations should be completed by October 29, 1907; all work to be done by the Chicago Union Traction Company at the expense of the traction company and the city of Chicago. Contracts were let by the Union Traction Company July 24, 1906, and work was commenced by the contractors within the time required. On October 12, 1906, the Secretary of War extended the time to April 1, 1907. The removal of the tunnel under the main branch of the river at La Salle street was completed on March 21, 1907, to a depth of about 28 feet, to within about 40 feet of the north and south docks, respectively. Because of new-found difficulties of the construction work, the Secretary of War, on April 3, 1907, extended the time for the completion of the Washington street tunnel to August 1, 1907, and of the Van Buren street tunnel (both on the South Branch) to March 1, 1908. In both of these tunnels work is now progressing with reasonable rapidity and with a fair prospect of being completed within the new time limits.

During the year the Sanitary District of Chicago has continued the work of securing a channel of 26 feet mid-river depth and 200 feet width through the South Branch of Chicago River from its mouth to the Drainage Canal entrance; but little was done in the year, however, efforts having been mainly directed toward securing rights of way and locating canals in the Evanston and Calumet districts. The removal of old center pier bridges and their substitution with bridges of the bascule type, so as to provide a clear navigable width of 140 feet at each locality, is still in progress. The main work of construction of the year was the building of the Seipp dock for about 200 feet south of Van Buren street, some dredging in front of

the same, the completion of the Twenty-second street bascule bridge, and the half completion of the Dearborn Street Bridge.

Complaints by vessel men of unreasonable delays at some of the bridges across the river have continued, as in former years. The action taken in each case has brought temporary relief, but not permanent correction of the abuse. Regulations to govern the operation of the Chicago River bridges were submitted for the approval of the Secretary of War August 9, 1906.

The field work has been carefully looked after by Assistant Engineer G. A. M. Liljencrantz.

The present condition of the river, as stated in the annual report of the assistant engineer, is as follows:

The channel in the Main Branch, to the junction of the South and North branches, has generally a clear depth of not less than 21 feet below Chicago city datum, except at the sides where shoaling has taken place, more or less. The South Branch and the part of the West Fork to Robey street form parts of the Sanitary District Canal and are maintained by the district. It has generally a depth of from 24 to 26 feet below hydraulic grade, except at the Washington and Van Buren street tunnels, which have not yet been lowered. (The La Salle Street Tunnel has been lowered to a depth of about 28 feet.

The South Fork of the South Branch has been dredged by the Sanitary District to 20 feet, but has shoaled up in many places, where now only about 16 to 18 feet are found. The North Branch between the Chicago, Milwaukee and St. Paul Railroad bridge and Fullerton avenue has an average depth in the regular channels of 17.4 feet. There are, however, many places that are very shallow, those of the least depths varying between 8.4 and 13 feet. Between Fullerton avenue and Belmont avenue the depth varies between 8 and 15 feet. In the North Branch Canal east of Goose Island the depths average from 16 to 20 feet.

The city of Chicago is about to dredge the channel in the west arm of the South Fork of the South Branch to within 15 feet of the shores (there are no docks here) to a depth of 14 feet between Thirty-ninth street and a point 700 feet north of it; but this part of the river is outside of the limits established for improvement by the United States Government.

It is proposed to apply the funds now available and those asked for the year ending June 30, 1909, to the work described in the survey report of November 14, 1899 (pp. 3865–3871, Annual Report, 1900).

Money statement.

July 1, 1906, balance unexpended		$83,876.08
Amount appropriated by river and harbor act approved March 2, 1907		300,000.00
		383,876.08
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$32,181.09	
For maintenance of improvement	2,599.90	
		34,780.99
July 1, 1907, balance unexpended		349,095.09
Amount (estimated) required for completion of existing project		270,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$100,000.00	
For maintenance of improvement	5,000.00	
		105,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

Allotment from act of August 18, 1894, for Chicago Harbor	$25,000.00
Act of June 3, 1896	50,000.00
Sundry civil act, June 4, 1897	113,000.00
Sundry civil act, July 1, 1898	400,000.00
Sundry civil act, June 6, 1900	62,000.00
Act of June 13, 1902	306,457.00
Received from sale of earth and old buildings	1,721.12
Act of March 2, 1907	300,000.00
Total	1,258,178.12

CONTRACT IN FORCE.

Name of contractor: Chicago and Great Lakes Dredge and Dock Company, Chicago, Ill.

Character of work: Dredging and construction of docks.

Price per unit: For dredging, 12.75 cents per cubic yard (measured in scows); removing stone wall and old substructure, $1.340; white-oak piles, each, $12.25; hard-wood piles, each, $6; sheet piling, $13.50 per linear foot; oak stringers, $45 per 1,000 feet; white-oak timber, $45 per 1,000 feet; pine timber, $40 per 1,000 feet; pine stringers, $37.50 per 1,000 feet; hemlock timber, $35 per 1,000 feet; anchor rods, 5 cents per pound; screw bolts, 5 cents per pound; driftbolts, 4 cents per pound; spikes and nails, 3½ cents per pound. Estimated total, $126,704.29.

Date of approval: March 1, 1905.

Date for beginning of work: March 9, 1905.

Date for expiration: July 1, 1906. Extended June 14, 1906, for a reasonable period. Completed October 23, 1906. Total payments, $121,250.07.

The commerce of this river has been reported under the head of Chicago Harbor, of which it is naturally a part.

L L 3.

IMPROVEMENT OF CALUMET HARBOR, ILLINOIS.

For general description of original condition of this harbor, its projects, and general results, see Summary, page 628.

There was no contract in force during the year. All original project work was completed in 1905, leaving only its maintenance.

In July soundings were taken in the basin sheltered by the breakwaters, at the approaches to the basin and to the entrance to the river, and over Calumet bar, where shoaling was suspected. The results are stated by the assistant engineer, as follows:

Some filling has occurred at the inner end of the anchorage basin and at the northwesterly side of the entrance to the main channel; also Calumet bar, at the approach to the harbor, has spread out to some extent, but the depth over it has increased by about 2 or 3 feet. The shallowest places found by this survey were 19.4 feet. There is, however, an ample anchorage ground of about 291 acres in area, protected by the breakwater, with not less than 21 feet in depth below Chicago city datum. The Illinois Steel Company has, in addition, dredged to a depth of from 22 to 23 feet the channel leading through this area to their private harbor, the entrance of which is about 3,000 feet northward from the river entrance. This company has also dredged, at their own expense, the channel between the United States harbor piers from the outer harbor up to the United States life-saving station, so as to enable their deep-draft ore vessels to enter their slip opening on the main channel. A map showing the result of the survey was sent to the office of the United States Lake Survey on February 18, 1907.

The automatic water gauge has been in operation during the year, tables of daily and monthly means were constructed and, together with the original record, were sent to the Lake Survey office at Detroit, Mich., as heretofore. The specially unusual flunctuations observed (all referred to Chicago city datum) were as follows:

Between 3.03 p. m. November 21 and 12.40 a. m. November 22, 1906, the lake rose 2.50 feet. On March 23, 1907, it rose 1.75 feet between 1.10 p. m. and 8 p. m., and fell again 1.10 feet between 8 p. m. and 9 p. m. the same day. On May 17, 1907, it fell 1.02 feet inside of twenty-five minutes between 3 p. m. and 3.25 p. m.

Highest water of year, +2 feet September 29, 1906, 11.25 p. m.; lowest water of year, —0.65 foot March 23, 1907, 1.10 p. m.

A subproject, for repairs and maintenance, was submitted, and approved March 23, 1907.

The field work has been carefully looked after by Assistant Engineer G. A. M. Liljencrantz.

The South Pier is in good condition, having lately been repaired in part and covered throughout its whole length with new decking, but the revetment at the inner end of the pier is badly decayed and in need of repair. The land back of this part of the pier is owned by the Iroquois Furnace Company. The North Pier is generally in fair condition. The breakwater and extension are in good condition, except that portions of the latter have settled to some extent, and that a number of deck planks and cross-ties have been torn off or broken by storms during the year.

It is proposed to expend the balance available for repairs and other maintenance.

Money statement.

July 1, 1906, balance unexpended	$95,320.31
Amount appropriated by river and harbor act approved March 2, 1907	20,000.00
	115,320.31
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,973.85
July 1, 1907, balance unexpended	113,346.46

APPROPRIATIONS.

July 11, 1870	$50,000.00	August 18, 1894	$15,000.00
March 3, 1871	50,000.00	June 3, 1896	75,000.00
June 10, 1872	40,000.00	March 3, 1899	150,000.00
March 3, 1873	40,000.00	June 6, 1900	185,350.00
June 23, 1874	25,000.00	March 3, 1901	255,000.00
March 3, 1875	25,000.00	Sundry civil act of June 28, 1902	215,000.00
August 3, 1876	20,000.00	Sundry civil act of March 3, 1903	204,480.00
June 18, 1878	15,000.00	March 2, 1907	20,000.00
March 3, 1879	12,000.00		
June 14, 1880	20,000.00		
March 3, 1881	30,000.00		
August 2, 1882	35,000.00	Total	1,567,230.00
July 5, 1884	20,000.00	Amount received from sale of property	1.00
August 5, 1886	10,000.00		
August 11, 1888	20,400.00		
September 19, 1890	20,000.00	Total	1,567,231.00
July 13, 1892	15,000.00		

COMMERCIAL STATISTICS.

Receipts and shipments by lake at South Chicago, Ill., during calendar year 1906.

Receipts.	Quantity.	Shipments.	Quantity.
	Tons.		*Tons.*
Coal	287,386	Flour	44,369
Salt	28,251	Wheat	124,147
Iron ore	4,084,936	Corn	371,580
Cement	210	Oats	22,814
Lumber	70,002	Rye	7,516
Shingles	1,477	Barley	11,541
Lath	32	Grass seed	262
Posts	1,340	Mill stuffs	14,964
Railroad ties	5,028	Malt	156
Poles	43,668	Oil cake	7,745
Wood	4,850	Lard	20
Copper	185	Tallow	314
Green fruits	49	Pork	56
Wheat	12,150	Hides and leather	52
Unclassified	6,094	Oil	227
		Sugar	500
		Wool and hair	75,188
		Unclassified	63,217
Total	4,545,658	Total	744,668

Comparison of receipts and shipments for years 1897 to 1906, inclusive.

Year.	Tons.	Year.	Tons.
1897	3,493,218	1902	4,454,428
1898	4,117,526	1903	4,742,225
1899	3,229,874	1904	3,728,260
1900	3,783,674	1905	4,530,394
1901	3,995,277	1906	5,290,826

L L 4.

IMPROVEMENT OF CALUMET RIVER, ILLINOIS AND INDIANA.

For general description of original condition of this river, its projects, and general results, see Summary, page 629.

Under the already existing contract with the Great Lakes Dredge and Dock Company, of Chicago, for removing the "rock section" between One hundred and eleventh and One hundred and fourteenth streets to a depth of 21 feet below Chicago city datum work was continued throughout the year except when stopped by the winter season (December to April). In conducting this work, the aim has been to secure as soon as practicable an available channel with full depth throughout the entire length of the rock section. The width of it was therefore divided into four equal parts of 50 feet each, with a view to completing each one successively, beginning with the deepest one at the westerly bank. This mode of procedure was followed as nearly as found practicable, though some deviation from it was found necessary to prevent the drill scow and the dredge from interfering with each other during the work, and operations were therefore progressing in more than one of these channels at the same time, and again, in blasting, as well as in removing the blasted material from

merely such as is made necessary by accidents and storms. The South Pier is in reasonably fair condition, though some of the decking is torn off and some of the top side timbers and ties are broken. The easterly and southerly breakwaters will need extensive repair before long. The superstructure and decking are considerably decayed and badly broken up in many places and should be replaced by concrete superstructure within a few years. The exterior breakwater is also decayed in scattered places, but might be repaired so as to last for several years. Soundings were taken in April, 1907, at the main entrance to the harbor, in the outer basin, and at the approach to it in the lake opposite the gap between the easterly and southerly breakwaters. These soundings indicate that there is a good channel with not less than 20 feet depth at the main harbor entrance, except along the sides; that some shoaling has occurred in the north part of the basin, which was dredged in 1902, and that the approach to the southerly entrance to the basin has only a depth of from 16 to 18 feet for a distance of about 1,800 feet east of the breakwater.

Surveys made during 1906 develop the need of considerable redredging just outside the southern entrance to the outer basin. This work will properly come under the head of maintenance and will be treated accordingly.

Money statement.

July 1, 1906, balance unexpended		$168,015.94
Amount appropriated by river and harbor act approved March 2, 1907		250,000.00
		418,015.94
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$51,795.84	
For maintenance of improvement	25,360.51	
		77,156.35
July 1, 1907, balance unexpended		340,859.59
July 1, 1907, amount covered by uncompleted contracts		72,782.73
Amount (estimated) required for completion of existing project		44,960.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$44,960.00	
For maintenance of improvement	10,000.00	
		54,960.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

July 11, 1870	$100,000.00	July 13, 1892	$72,000.00
March 3, 1871	100,000.00	August 18, 1894	80,000.00
June 10, 1872	90,000.00	March 3, 1899	100,000.00
March 3, 1873	90,000.00	March 3, 1905	200,000.00
June 23, 1874	75,000.00	March 2, 1907	250,000.00
March 3, 1875	78,000.00		
August 3, 1876	5,000.00	Total appropriated	2,360,000.00
June 18, 1878	75,000.00	Received from all sources since 1870 (transfer of tugs, sales, etc)	936.46
March 3, 1879	75,000.00		
June 14, 1880	145,000.00		
March 3, 1881	150,000.00		
August 2, 1882	200,000.00	Total appropriated	2,360,936.46
July 5, 1884	100,000.00	Transferred to Chicago River	25,000.00
August 5, 1886	75,000.00		
August 11, 1888	200,000.00		
September 19, 1890	100,000.00		2,335,936.46

mainly sand, mud, and clay, without any rock or other undredgable material down to a depth of 22 feet below Chicago datum. The borings were made all along each bank, close thereto, and at 200 feet intervals between borings or at 100 feet intervals along the river.

Specifications are under preparation for work in accordance with the recently approved subprojects (E. D. 7880/43 & 44).

No deeds have yet been received or offered for lands needed for either the turning basins below the forks or for a river channel above the forks, although such deeds for three turning basins are expected within the coming year.

Channel lines for Grand Calumet River.—In the river and harbor act approved June 13, 1902, authority was given the Secretary of War to receive, on behalf of the United States, deeds from the property owners along the river between the forks and one-half mile east of Hammond, Ind., for a right of way 200 feet in width. No definite action has as yet been taken by the property owners, but early this season some of their representatives notified this office that they were now ready to act. As, however, it is very likely that the channel, in part of which there is at times a strong current, has changed its banks more or less during the twenty-two years since the first survey was made of this part of the river (in 1885), it was deemed desirable to resurvey it, which has been done. The field notes are now being plotted.

A preliminary examination of the river from One hundred and twentieth street to the forks with a view to deepening the channel to 21 feet total depth, as ordered by the act of March 2, 1907, is in progress.

By outside parties, but under War Department permits and supervision by this office, special work has progressed as follows:

Still under permit and unfinished: Construction of 1 new bridge over Main River and 2 over Grand Calumet, maintenance of 2 temporary bridges, construction of 2 new docks on Main River, and laying of 1 electric cable crossing.

The field work has been carefully looked after by Assistant Engineer G. A. M. Liljencrantz.

The act of March 4, 1907, provided that contracts could be entered into for material and work under the 1903 project to an extent not exceeding $170,000 in excess of funds now in hand. It is expected that this money will complete the improvement. It is proposed to expend the funds now available and the other funds already promised upon the deepening of the channel to 20 feet draft up to One hundred and twenty-second street and to 16 feet draft up to the forks, and meanwhile to dredge out 5 proposed turning basins as fast as lands are donated therefor; all in accordance with existing approved projects and provisions of the appropriations.

Money statement.

July 1, 1906, balance unexpended	$241,963.21
Amount appropriated by river and harbor act approved March 2, 1907	191,500.00
Amount appropriated by river and harbor act approved March 4, 1907	20,000.00
	453,463.21
June 30, 1907, amount expended during fiscal year, for works of improvement	45,545.91
July 1, 1907, balance unexpended	[a] 407,917.30
July 1, 1907, amount covered by uncompleted contracts	201,003.48
Amount (estimated) required for completion of existing project	170,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	170,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

July 5, 1884	$50,000.00	June 13, 1902	$75,000.00
August 5, 1886	30,000.00	April 28, 1904 (allotment)	[b] 41,718.98
August 11, 1888	50,000.00	March 3, 1905	100,000.00
September 19, 1890	50,000.00	June 30, 1906	156,000.00
July 13, 1892	75,000.00	March 2, 1907	191,500.00
August 18, 1894	45,000.00	March 4, 1907 (s. c.)	20,000.00
June 3, 1896	50,000.00		
March 3, 1899	60,000.00	Total	994,218.98

CONTRACTS IN FORCE.

Name of contractor: Great Lakes Dredge and Dock Company, Chicago, Ill.

Character of work: Rock excavation and dredging.

Price per unit: For rock, $2.25 per cubic yard, measured in place; soft material, 12.75 cents per cubic yard, measured in scows. Total originally estimated at $168,487.50. Present conditions indicate an actual total of only about $150,000 (about $139,000 rock and about $11,000 soft material).

Date of approval: June 30, 1905.

Date for beginning of work: July 1, 1905; actual commencement, July 7, 1905.

Date for expiration: June 30, 1907; extended June 21, 1907, for a reasonable period.

Name of contractor: Great Lakes Dredge and Dock Company, Chicago, Ill.

Character of work: Dredging (between One hunderd and fourteenth and One hundred and twenty-fourth streets).

Price per unit: 19¾ cents per cubic yard, place measurement. Total estimated at $83,000.

Date of approval: April 11, 1907.

Date for beginning of work: April 15, 1907; actual commencement, April 30, 1907.

Date for expiration: Two hundred and forty good working days from April 15, 1907.

The commerce of this river has been reported under the head of Calumet Harbor, of which it is naturally a part.

[a] Includes $5,257.70 for "Above the Forks."

[b] Omitting $1,281.02 returned to the Treasury.

L L 5.

IMPROVEMENT OF MICHIGAN CITY HARBOR, INDIANA.

This work was transferred to my charge June 8, 1907.

For general description of original condition of this harbor, its projects, and general results, see Summary, page 632; and a full description of this harbor and its condition in 1907 is to be found on pages 151–156, Bulletin No. 17, issued by United States Lake Survey Office, Detroit, Mich.

Outer harbor.—All work of the last project (1897) was completed in 1905 except a 200-foot length of the southwest end of the detached breakwater, estimated to cost $30,000, and for which funds were appropriated by the act of March 2, 1907.

Inner harbor.—All work of the last definite project (1882) was completed several years ago except about 1,000-foot length of the upstream end of the river next the Lake Erie and Western (formerly I. P. C.), railroad bridge; this work having been postponed because the proper maintenance of the rest of the river and harbor required the use of all available funds. This uncompleted work is now estimated at about 64,000 cubic yards of dredging, to cost about $16,000.

Both harbors.—No work was done prior to April, 1907, because of little demand therefor. Soundings were taken in May, 1907, showing the following available depths, referred to the level of zero of gauge (about 3 feet above dead low water): At the outer entrance, 22 feet; at the inner entrance, 19 feet; but a shoal projecting in front of the breakwater pier showed only 11.5 feet 40 feet from the pier at station 2; between the piers, 15.2 feet; at the Franklin Street Bridge and thence to the first angle above Sixth Street Bridge, 15 feet; at the second angle, 10 feet; and at the foot of the upper basin, 6 feet. The stage of the lake at the time of the soundings was —0.3 to —0.6 foot; and between May 23 and 31 the U. S. dredge *Gen. Gillespie* reduced the shoal in front of the breakwater pier just outside the inner entrance and widened and deepened the channel between the piers. The quantity dredged was 11,772 cubic yards.

Under contract made in April, 1907, with Greiling Bros., a commencement was made upon dredging the midchannel of the river just above and below the lowest bridge to remove deposits of the preceding year; and on June 28 and 29, 1907, 850 cubic yards of sand were removed. The rest of the contract will be completed early in July.

Condition of work.—The present condition of the work is practically the same as described on page 1793, Annual Report, 1906, except that about $1,000 of work, more than there named, should be done in replacing stone washed out of the outer breakwater and inner piers during the past year. The southwest entrance pier is not liable to last more than one or two years longer without extensive repairs, and then it will be far more advantageous to Michigan City commerce and general navigation if this pier be entirely rebuilt at its inshore end in a location about 125 feet farther toward the southwest, so as to place it in prolongation of the outer half of the pier (newest half) and make the two entrance piers parallel to each other, and then removing the old half pier and dredging the river entrance to its full uniform width of about 225 feet. Such work, if authorized, *will cost about* $61,000. But temporary repairs, to last for the next

one or two years, may be done for about $6,000, and may be found necessary during the coming year.

Owing to deposits due to freshets from the upper river, from leakage of sand through the entrance piers and to drift from the lake during storms, a large amount of redredging is necessary in the river to allow of a good 15-foot draft at lowest water. Such redredging is now estimated at 200,000 cubic yards, and to cost about $50,000.

The work now in sight in this harbor yet to be done is, therefore, now estimated at—

Completion of 1882 project (dredging)	$16,000
Completion of 1897 project (breakwater)	30,000
Maintenance of southwest entrance pier	6,000
Maintenance of other piers and breakwater	1,000
Maintenance of river channel depth	50,000
Superintendence and contingencies	9,000
	112,000

As there is now unpledged about $82,000, there is needed about $30,000 more to complete work and bring the maintenance up to date. An additional $10,000 is also estimated for further maintenance of the next year or two.

Should Congress authorize the moving back of the southwestern pier and widening of the inner half of the river entrance, an additional $55,000 will be necessary.

It is proposed to expend the present available funds upon the completion of the projects of 1882 for the river and 1897 for the lake front and upon their maintenance.

Money statement.

July 1, 1906, balance unexpended		$27,288.46
Amount appropriated by river and harbor act approved March 2, 1907		60,000.00
		87,288.46
June 30, 1907, amount expended during fiscal year for maintenance of improvement		2,305.19
July 1, 1907, balance unexpended		84,983.27
July 1, 1907, amount covered by uncompleted contracts		2,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$30,000.00	
For maintenance of improvement	10,000.00	
		40,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

Date.	Outer harbor.	Inner harbor.	Total.
July 4, 1836			$20,000.00
March 3, 1837			30,000.00
July 7, 1838			60,733.59
June 11, 1844			25,000.00
August 30, 1852[a]			20,000.00
March 2, 1855 (claim of J. R. Bowes)			470.33
June 28, 1866			75,000.00

[a]Amount carried to surplus fund, $5.15.

APPROPRIATIONS—Continued.

Date.	Outer harbor.	Inner harbor.	Total.
July 25, 1868 (allotment)			$25,000.00
April 10, 1869 (allotment)			31,185.00
July 11, 1870	$25,000.00		25,000.00
March 3, 1871	15,000.00		15,000.00
June 10, 1872	50,000.00		50,000.00
March 3, 1873	50,000.00		50,000.00
June 23, 1874	50,000.00		50,000.00
March 3, 1885	50,000.00		50,000.00
August 14, 1876	35,000.00		35,000.00
June 18, 1878	50,000.00	$25,000.00	75,000.00
1878 (allotment)	2,500.00		2,500.00
March 3, 1879	40,000.00		40,000.00
June 14, 1880	40,000.00	15,000.00	55,000.00
March 3, 1881	20,000.00	25,000.00	45,000.00
August 2, 1882	60,000.00	20,000.00	80,000.00
July 5, 1884	40,000.00	10,000.00	50,000.00
August 5, 1886	54,375.00	1,875.00	56,250.00
August 11, 1888	90,000.00	5,000.00	95,000.00
September 19, 1890	50,000.00	7,500.00	57,500.00
July 13, 1892	30,000.00	15,000.00	45,000.00
August 18, 1894	20,000.00	10,000.00	30,000.00
June 3, 1896	70,000.00	10,000.00	80,000.00
March 3, 1899		7,500.00	7,500.00
June 6, 1900	195,000.00		195,000.00
June 13, 1902			63,000.00
March 3, 1905			45,000.00
March 2, 1907			60,000,00
Miscellaneous receipts			4,130.00
Total	1,036,875.00	151,875.00	1,648,268.92

CONTRACTS IN FORCE.

DREDGING.

Contractor: Great Lakes Dredge and Dock Company.
Date of contract: March 21, 1906.
Date of approval: April 2, 1906.
Date of beginning: April 20, 1906.
Date of expiration: October 5, 1906. (Time limit waived.)
Work: Dredging for maintenance of channel, at 17 cents per cubic yard.

Contractor: Greiling Bros.
Date of contract: April 3, 1907.
Date of approval: April 15, 1907.
Date of beginning: May 2, 1907.
Date of expiration: October 2, 1907.
Work: Dredging for maintenance of channel, at 21½ cents per cubic yard.

COAL FOR U. S. DREDGE GEN. GILLESPIE.

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia Crown Hill, $3.10 per ton; Youghiogheny, $3.25 per ton; Hocking Valley, $2.95 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $2.85 per ton.

COMMERCIAL STATISTICS FOR MICHIGAN CITY HARBOR, INDIANA, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statements furnished by the deputy collector of customs and Indiana Transportation Company, at Michigan City, Ind.]

Character of vessels.	Number.	Tonnage.
Steam, entered and cleared	522	.....
Sail, entered and cleared	40	.....
Total	562	694,604

Maximum draft, 15 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Lumber	58,803	Miscellaneous merchandise	85
Laths	31		
Shingles	280		
Railroad ties	14,157		
Wood	4,258		
Cedar posts	80		
Salt	11,172		
Fish	4		
Miscellaneous merchandise	300		
Total	89,085	Total	85

	Tons.
Total freight carried in 1905	91,910
Total freight carried in 1906	89,170
Decrease	2,740

L L 6.

SURVEY OF ILLINOIS AND DES PLAINES RIVERS, ILLINOIS, FOR WATERWAY FROM LOCKPORT, ILLINOIS, TO ST. LOUIS, MISSOURI.

The survey, maps, plans, and estimates for a 14-foot waterway from Lockport, Ill., to the mouth of the Illinois River, conducted under the Board of Engineer Officers, appointed by Special Orders, No. 19, Headquarters Corps of Engineers, July 5, 1902, were completed, and the final report of the Board submitted August 26, 1905. The report has since been published as House Document No. 263, Fifty-ninth Congress, first session, and contains much valuable data, including map of the Illinois and Des Plaines rivers from Chicago to the mouth of the Illinois River, in fourteen sheets.

The operations during the year consisted of minor office work and care of property. The remainder of the funds carried over from last year was expended in March, and reports discontinued.

Money statement.

July 1, 1906, balance unexpended	$332.20
June 30, 1907, amount expended during fiscal year	332.20

L L 7.

REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

Sloop *Peri* in North Branch of Chicago River near Fullerton avenue. The wreck of this vessel was reported as an obstruction to navigation by the department of public works of the city of Chicago, which stated that it was abandoned and that the owners could not be located. The wreck was raised, found worthless, and destroyed at a total cost to the United States of $251.51.

Schooner barge *H. A. Richmond*, owned by R. F. Conway Company, in the Main Branch of Chicago River near Rush Street Bridge. The wreck of this vessel was reported as an obstruction to navigation by the department of public works of the city of Chicago. The wreck having been formally abandoned, it was raised, found worthless, and was then sunk in Lake Michigan in 50 feet depth of water in such way as to no longer interfere with navigation, at a total cost to the United States of $817.77.

APPENDIX M M.

IMPROVEMENT OF ILLINOIS RIVER, AND CONSTRUCTION OF ILLINOIS AND MISSISSIPPI CANAL, ILLINOIS.

REPORT OF MAJ. C. S. RICHÉ, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Illinois River, Illinois.
2. Operating and care of La Grange and Kampsville locks, Illinois River, and approaches thereto.
3. Illinois and Mississippi Canal.

UNITED STATES ENGINEER OFFICE,
Chicago, Ill., July 5, 1907.

GENERAL: I have the honor to transmit herewith annual reports upon works in my charge for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

C. S. RICHÉ,
Major, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

M M 1.

IMPROVEMENT OF ILLINOIS RIVER, ILLINOIS

(A) BELOW COPPERAS CREEK.

During the fiscal year the work has consisted of inspection of the river throughout its navigable length, especially at bridges, removal of snags, repairs to plant and fleet, and dredging bars.

The matter of establishing harbor lines at Peoria, Ill., has been discussed by Peoria interests at various times for many years past. The encroachments upon the river channel at that point, and the gradual filling of the original channel at critical points with refuse and solid matter led to complaints and investigation. On December 18, 1906, a public hearing was held at Peoria, local interests having been invited to attend. Lines were surveyed and agreed upon, along the city front, on both sides of the river. Tracing and description of such harbor lines were approved by the Secretary of War.

The pile driver belonging to the Illinois River fleet was loaned at a rental of $5 per day, three days to the Chicago, Burlington and Quincy Railroad Company, and three days to Schultz-Baujan Company, under special authorities, and the proceeds deposited to the credit of the Treasurer of the United States.

Department permit was issued in February for a new wagon bridge across the river at Utica, to replace the bridge carried out by flood in June, 1906. A ferry operating under Department authority has accommodated the local traffic in the meantime.

Ten dump cars, being of no further use on this improvement, were sold at public sale March 29, 1907 (E. D. 38302-62), for $300, and proceeds deposited to credit of the appropriation.

The water over the bar at the foot of Hurricane Island having become shoal, a channel 200 feet wide was dredged through the bar, 8,243 cubic yards being removed.

Seven round trips of inspection were made between Grafton and La Salle, and 119 snags removed from or near the channel.

The dredge *Apache*, towboat *Fox*, 1 quarter boat, 3 dump scows, and 2 barges were transferred to the Mississippi River for work on Rock River pool of Illinois and Mississippi Canal.

In view of the appropriation of March 2, 1907, for $50,000 for improving Illinois River from Copperas Creek to La Salle, work under which will be carried on with the same plant as is used on the lower river, repairs to boats and the building of three new scows has been planned and lumber ordered for that purpose.

Repairs were made during the year to 3 dredges, 2 steamboats, 1 pile driver, 3 quarter boats, 3 barges, 2 dump scows, and 5 skiffs.

During May, 1907, the steamer *Col. A. Mackenzie*, belonging to the Mississippi River Improvement, made a trip up the Illinois River to La Salle, removing 114 snags, besides wrecks, leaners, stumps, and other obstructions.

The navigation of the Illinois River annually increases in importance, and more supervision is required from year to year. The conflicting interests of boat owners and bridge owners become more apparent with the gradual deterioration of old wagon bridges and the demands of trolley lines for new crossings. The towns in the valley generally oppose the demand for modification and repair of bridges, on the ground of expense, and as such towns are, in general, already heavily bonded, their reluctance to undertake bridge repairs or replacements is to be expected. The growing agitation for a deep waterway through the Illinois Valley has perhaps raised the hopes of the marine interests and made them more critical of existing conditions, but it is unquestionable that at certain points on the river, as at Peoria, the convenience and facility of river navigation have in the past been sacrificed to some extent in the furtherance of city, railroad, and private purposes. This has resulted in conditions which will in the future require careful adjustment between navigation interests and vested interests, especially in the matter of bridges

The Illinois River is well adapted to improvement by reason of slope and nature of river bed. The State of Illinois, through its legislature, has exhibited great interest in the promotion of a waterway from Lake Michigan to the Mississippi River through this

valley. In such an improvement there would be involved three distinct results, the extension of navigation, the disposal of the sewage of Chicago, and the development of an enormous water power. While possibly any one of these three objects is not sufficient at present to induce State action in the matter, the combined weight of the three furnishes a strong argument to the advocates of such a waterway.

The number of arrivals and departures of vessels to and from St. Louis via the Illinois River during the calendar year 1906, and the tonnage carried by such boats, shows an increase of fully 50 per cent over the preceding year. This tonnage is but a small portion of the total river traffic.

FROM COPPERAS CREEK TO LA SALLE.

The first appropriation for this stretch of the river was made by the river and harbor act of March 2, 1907, thus definitely placing the whole river from its mouth to La Salle under United States jurisdiction. Project for the improvement was approved by the Department April 6, 1907, the appropriation of $50,000 to be expended for the general purpose of securing and maintaining a depth of 7 feet at low water of 1901, with 200 feet width. Surveys have been made to determine points where dredging is required, and plant is being prepared for such dredging. The steamer *Col. A. Mackenzie*, in May, 1907, included this portion of the river in its trip of snagging and inspection, removing snags and obstructions as far as the stage of water would permit.

PROPOSED APPLICATION OF FUNDS.

It is proposed to apply the available funds on both divisions of the river, and the additional appropriation recommended for the river from its mouth to Copperas Creek, to securing and maintaining a navigable channel of 7 feet depth and 200 feet width from the mouth of the river to La Salle, to maintaining and rebuilding plant, removing snags and other obstructions, and making such local surveys as may become necessary from time to time.

Money statements.

BELOW COPPERAS CREEK.

July 1, 1906, balance unexpended		$31,589.58
Amount received from sale of plant		300.00
Amount appropriated by river and harbor act approved March 2, 1907		50,000.00
		81,889.58
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$7,937.14	
For maintenance of improvement	3,000.00	
		10,937.14
July 1, 1907, balance unexpended		70,952.44
July 1, 1907, outstanding liabilities		1,500.00
July 1, 1907, balance available		69,452.44
Amount (estimated) required for completion of existing project		142,000.00

COPPERAS CREEK TO LA SALLE.

Amount appropriated by river and harbor act approved March 2, 1907	$50,000.00
June 30, 1907, amount expended during fiscal year, for works of improvement	1,500.48
July 1, 1907, balance unexpended	48,499.52
July 1, 1907, outstanding liabilities	500.00
July 1, 1907, balance available	47,999.52

APPROPRIATIONS.

BELOW COPPERAS CREEK.

June 30, 1880, available from previous appropriations	$38,337.81	August 18, 1894	$35,000.00
June 14, 1880	110,000.00	June 3, 1896	40,000.00
March 3, 1881	250,000.00	March 3, 1899	100,000.00
August 2, 1882	175,000.00	June 3, 1902	75,000.00
July 5, 1884	100,000.00	March 2, 1907	50,000.00
August 5, 1886	112,500.00		1,585,837.81
August 11, 1888	200,000.00	Received from all other sources	835.40
September 29, 1890	200,000.00		
July 13, 1892	100,000.00	Total	1,586,673.21

COPPERAS CREEK TO LA SALLE.

March 2, 1907	$50,000.00

COMMERCIAL STATISTICS.

Arrivals and departures of steamboats and barges at St. Louis, Mo., via Illinois River, calendar year 1906.

Month.	Arrivals.	Departures.	Month.	Arrivals.	Departures.
January			August	13	12
February			September	19	15
March	7	7	October	32	31
April	8	9	November	11	7
May	10	10	December	5	1
June	10	10			
July	18	15	Total	133	117

	Tons.
Receipts	14,550
Shipments	7,835

M M 2.

OPERATING AND CARE OF LA GRANGE AND KAMPSVILLE LOCKS, ILLINOIS RIVER, AND APPROACHES THERETO.

These locks and dams have been operated and maintained under the indefinite appropriation provided by section 4 of the river and harbor act of July 5, 1884.

The river was open to navigation at La Grange lock the entire year except two weeks in January and February. From July 1, 1906, to March 10, 1907, boats passed through the lock, and after March 10 two-thirds of the boats passed through the lock, the rest going over the dam.

At La Grange the revetment below the land wall was repaired and fender piles driven. The entrances to the lock were dredged, 3,010 cubic yards being removed.

The sanitary district, in October, 1906, resumed the work of lowering La Grange dam, as authorized by Congress and by the Secretary of War. The work was stopped by a rise in the river November 27, and nothing more has been done.

At Kampsville the river was open to navigation the entire year except ten days in February. No boats passed the lock, however, from December 16 until March 7, and since the latter date most of the boats have been able to go over the dam.

The entrance to Kampsville lock and chamber were dredged, 6,157 cubic yards of material being removed.

During the low water of July, 1906, an attempt was made to operate the flashboards provided by the sanitary district, and it was found that they will not work satisfactorily.

The accompanying tables, showing the number of boats navigating the river and the number of times they have passed the locks during the past fiscal year, show an increase in all features over the preceding year.

PROPOSED APPLICATION OF FUNDS.

The funds to be allotted will be used for ordinary maintenance, repairs, contingencies of service, and for renewing the gates of the Kampsville lock.

Summarized statement of expenses from appropriation for operating and care of canals and other works of navigation (indefinite) applied to La Grange and Kampsville locks, Illinois River.

La Grange lock:		
Services	$6,329.92	
Materials	99.84	
Supplies	158.51	
Total		$6,588.27
Kampsville lock:		
Services	6,262.71	
Materials	77.35	
Supplies	90.01	
Telephone	16.90	
Travel	24.89	
Total		6,471.86
Grand total		13,060.13

COMMERCIAL STATISTICS FOR FISCAL YEAR ENDING JUNE 30, 1907.

		Tonnage passing—	
		La Grange lock.	Kampsville lock.
Steamboats	number	553	354
Barges	do	472	73
Tonnage of steamboats	tons	101,141	109,971
Tonnage of barges	do	62,667	10,292
Passengers	number	9,742	13,339
Live stock	head	8,972	26,742
General merchandise	tons	2,401	5,558
Grain	do	9,346	2,531
Apples	do	958	1,346
Coal	do	5,805	50
Wood	do	120	.....
Logs	do	5,805	.....

List of boats navigating the Illinois River during the fiscal year ending June 30, 1907.

Name.	Tonnage.	Trips passed—	
		La Grange lock.	Kampsville lock.
Bald Eagle	468	139	159
Grey Eagle	555	1	25
Spread Eagle	691	.....	6
David Swain	146	14	4
Tennessee	334	.....	10
J. S	236	6	10
Lily	200	6	6
Illinois	168	34	10
City of Peoria	128	20	10
Chas. B. Pearce	223	2	2
Conquest	220	2	2
Columbia	197	2	2
Saturn	180	2	2
Vernie Mac	122	2	2
Gardie Eastman	100	.....	10
Lona	257	1	1
Elenore	97	125	10
Mary	50	70	18
Ebaugh	50	44	.....
H. W. Longfellow	47	33	2
Louise	18	2	9
R. G. Schmoldt	19	19	2
Ouatoga	18	.....	4
Louise Rumsey	7	.....	11
Ocean Spray	10	.....	8

In addition to the above list of boats, 28 other boats with a tonnage varying from 4 tons to 76 tons, made 55 trips through the locks.

M M 3.

ILLINOIS AND MISSISSIPPI CANAL.

Operations have been carried on during the year over the entire canal with the object of bringing unfinished parts to completion as nearly as possible in the order required for an early opening and watering. Finished parts and structures have been repaired and maintained. Several important contracts have been completed during the year and work upon structures by hired labor has been in progress almost continuously. The work which was embarrassed by

actual and threatened litigation the previous year was cleared of such difficulties and has been proceeding satisfactorily.

Maintenance work of parts finished several years ago is becoming important, as banks left dry are subject to deterioration from burrowing animals, sloughing, and occasional floods in adjacent streams, while both metal and wood parts of structures require repairs from time to time.

It has been found that the cut through Cecils Slough, which was in part experimental, will stand under normal conditions, and excavation there was completed.

The work for which certain plant was purchased having been completed, and such articles being of no further use on the canal or in the district, authority was asked and obtained for the sale of such plant, as follows:

Steam shovel	1
Locomotives	4
Dump cars	64
Cableway	1
Dredge	1
Flat cars	43
Tons steel rails, frogs, etc	1,208.35

the proceeds being deposited to the credit of the canal appropriation. The principal item in the sales consisted of steel rails, and by reason of their advance in price since the construction railway was installed, the price realized at the sale was nearly as much as the rails cost when purchased several years ago.

It is believed that all work which is to be done by formal contract has now been placed under contract, and all such contracts have been completed except two now in force.

It was found that emergency gates would be necessary on mile 23 to cut off that part of the canal through Cecils Slough in case of a break in the banks. Plans were drawn, materials purchased, and the work of building these gates is well advanced.

An allotment of $20,000 from the canal appropriation was made for the work of dredging in the Rock River pool, which allotment is being expended under the Rock Island office.

An exchange of a small triangle of land at Lock 6 was effected with the Chicago, Rock Island and Pacific Railroad, and deeds exchanged.

The work which had been the subject of contracts with Charles Stone and the Savage Construction Company, both defaulted, was completed by hired labor, and report and accounting of cost was made.

Several complaints were received during the year from landowners along the canal who stated that their drainage had been interfered with. These were investigated and where they were well founded relief was afforded by opening ditches.

The principal work remaining to be done is the completion of the dam at the head of the feeder, at Rock Falls. The discussion of plans and location of this dam dates back to 1900. There was involved the difficulty of complying with the decree of court, the complications liable to arise over injury to private interests, and the necessity of compromising with the Sterling Hydraulic Company for the conservation of their existing interests in the water power secured to

them by State charter and by long undisputed possession. The progress of the negotiations in this matter has been made the subject of many special reports. The demands for compensation were at first excessive, and the matter was discussed at many conferences with representatives of the company. Alternative plans were considered and work on the dam postponed pending some settlement, which would insure the United States freedom from injunctions and from damage claims. Finally, on December 6, 1906, the Sterling Hydraulic Company agreed in writing to accept the plans for the dam, at the original site, waiving their claims for damages upon condition that certain legislation be enacted by Congress. In pursuance of this understanding the item desired was incorporated in the river and harbor act of March 2, 1907. The settlement is considered the best which could have been obtained of a very perplexing problem.

In view of the approaching completion and watering of the canal, openings in fences were closed, privileges of driving and pasturing on the right of way denied, and notices posted upon canal structures warning against trespass upon the right of way.

Forces were reduced when possible and remaining forces concentrated upon work remaining unfinished. A force was assigned to the work of testing the locks and to attend to the details of preparing the canal for watering with the object of insuring the safety of the banks at all points.

The bulk of the earthwork on the canal was executed several years ago when prices for such work were comparatively low, and although maintenance charges have accumulated, a net saving has resulted. On some of the miles the prices paid were not more than one half of the amount that would be asked were the work to be let to contract under present conditions. The same applies to purchase of timber, steel, cement, and supplies.

As indicated in previous reports, the charges for maintenance are being paid from the appropriation for construction of the canal. Such charges have been as follows:

Eastern section	$41,739.93
Western section and feeder	8,017.29
Moline wagon bridge	25,000.00
Total	74,757.22

It is expected that the canal will be opened during the fiscal year 1908. No estimate can now be made of its commercial utility further than to state that it will be a convenient means of local traffic in bulky shipments and a navigable feeder to both the Mississippi and the Illinois rivers. The country through which the canal passes has developed considerably since the project was adopted; lands have enhanced in value and population and transportation facilities have increased.

The State dam at Henry maintains a pool in Illinois River for some 14 miles, forming practically a continuation of the Illinois and Mississippi Canal. It may be remarked that the canal was undertaken largely as a link in a navigable waterway from the Great Lakes to the Mississippi River, and early reports showed little or nothing bearing upon its prospective utility as an independent work. The

conditions are still much as suggested by Maj. T. H. Handbury in the final paragraph of his report of February 10, 1886:

Before the benefits claimed for the Hennepin Canal can be fully realized to commerce some one of the projects above outlined for continuing the improvement to the lake must be carried forward to completion.

Since the date of the report referred to, the desired connection has been brought closer by the operations of the sanitary district of Chicago, which have taken the waters of Lake Michigan in a navigable channel as far as Lockport. In this connection the following extract from the annual report of Maj. W. L. Marshall for 1891 is also applicable:

This canal (Hennepin) is designed as a cut-off or short route from the upper Mississippi to Lake Michigan in connection with the present existing water lines or with improved routes of greater capacity that have been contemplated for years. * * * The present water route from Chicago, at Bridgeport, to the mouth of Rock River is, as shown, 607 miles, while by way of the proposed Illinois and Mississippi Canal it will be 183 miles only, a saving in distance from Lake Michigan by water to all points on the Mississippi River above the mouth of Rock River of 419 miles over existing water routes. * * * To secure, therefore, the full benefits of the proposed canal the water route from Chicago to La Salle must be enlarged or the capacious channel now being constructed on the lower Illinois River be extended to Chicago via the Illinois and Des Plaines Valley and a cut across the Chicago divide. Without such works the Illinois and Mississippi Canal will be of comparatively small significance.

The operations in detail for the fiscal year follow:

Feeder.—Plans for sluiceways and crib dam across Rock River at the head of the feeder were approved by the Secretary of War July 19, 1906, and construction at once begun. The entire area for the sluiceways was inclosed by a cofferdam 1,350 feet long and masonry was completed and sills laid, masonry consisting of the south abutment, the upper 34 feet of walls of proposed lock in dam, 18 piers and 19 sills for sluice gates, containing 3,600 cubic yards of Portland cement concrete. Cofferdam was removed and needle dam erected across the opening left for lock.

Plans were drawn for steel cylindrical sluice gates for the dam, two cylindrical gates at head of feeder, and for emergency gates at the crossing of Green River; contract was let, and about one-half the cylindrical gates have been delivered.

A temporary bridge has been built over completed masonry, a cofferdam 1,500 feet long, inclosing the site of the work remaining to be done on the dam, has been built, and the area laid dry.

At the guard lock oak sills for needle dams, lock gates, and sluice gates were laid, and lock gates erected. The two steel gates controlling flow of water down the feeder were also erected. Timber cribs were built, slope paving laid, and cross banks removed, and feeder connected with Rock River.

The masonry for highway bridges was completed, except for bridge No. 45, the superstructures for all of the bridges erected, painted, and floors laid so far as supply of lumber permitted. At highway bridge No. 45 the work is in progress and will be soon completed.

Western section.—At aqueduct 4, steel was painted, joints filled, and pine sheeting cut off, and towpath floor laid.

At aqueduct 5 cross banks were removed, steel painted, joints filled, and waling timbers placed.

At aqueduct 6, the work which was the subject of contract with Savage Construction Company, failing contractors, was completed. Steel was assembled, riveted, reinforced concrete linings placed, waling timbers placed, and towpath floor laid.

At aqueduct 7, waling timbers were placed and towpath floor laid.

At aqueduct 8, waling timbers were placed and towpath floor laid. Construction of outlet from Lock 29 into Rock River was completed.

Eastern section.—Deposits of peat, gravel, and sand were removed from canal prism; crevasses and openings left for drainage were closed; banks were patrolled during high water. Highway bridge approaches damaged by floods were repaired; decayed floors of highway bridges 1, 2, 3, 4, and 10 were replaced; ditches were kept open, and in many cases deepened; 56 miles of right-of-way fence was kept in repair, and 2 miles of fence moved into the boundary of right of way. Tile was laid in Cecil's Slough to connect with lines of tile laid by landowners for drainage. Concrete linings of three aqueducts were calked with coal-tar pitch; intakes were repaired and Canada thistles cut from the right of way. Approaches were built for ponton bridge near Lock No. 2; highways were maintained as required by decree of court in condemnation cases. Slope paving and stone revetment were placed at bridge abutments; slopes were seeded. Wooden bridge on mile 5, maintained by order of the court, was rebuilt. Ground hogs and muskrats burrowing in the canal banks were killed with chemicals and holes filled. Lock gates were tested. Emergency gates at west end of mile 23 are in progress of construction, foundations and concrete walls being completed and 50 per cent of the concrete placed in splay walls.

PROPOSED APPLICATION OF FUNDS.

The funds now available are expected to complete the canal sufficiently for opening to navigation, to which purpose they will be applied.

Money statement.

July 1, 1096, balance unexpended	$527,034.52
Amount received from sale of plant, etc	46,558.95
	573,593.47
June 30, 1907, amount expended during fiscal year, for works of improvement	[a] 267,755.92
July 1, 1907, balance unexpended	305,837.55
July 1, 1907, outstanding liabilities	15,000.00
July 1, 1907, balance available	290,837.55
July 1, 1907, amount covered by uncompleted contracts	21,500.00

[a] Includes $20,000 allotted Rock River pool.

APPROPRIATIONS.

July 1, 1890, balance unexpended from previous appropriations	$786.46
Act of—	
September 19, 1890	500,000.00
July 13, 1892	500,000.00
August 17, 1894	190,000.00
June 3, 1896	45,000.00
Sundry civil act—	
June 4, 1897	875,000.00
July 1, 1898	1,427,740.00
March 3, 1899	700,000.00
June 6, 1900	1,000,000.00
March 3, 1901	975,000.00
June 28, 1902	733,220.00
Act of March 3, 1905	300,000.00
Sundry civil act June 30, 1906	200,000.00
	7,446,746.46
Received from all other sources	47,787.96
Total	7,494,534.42

Total expenditures Illinois and Mississippi Canal for fiscal year 1907.

Eastern section Illinois River to feeder junction	$45,441.84
Western section, feeder junction to Rock River	69,538.18
Feeder line	132,775.90
Allotted for Rock River pool	20,000.00
Total	267,755.92

Total expenditures Illinois and Mississippi Canal to end of fiscal year 1907.

Eastern section	$3,087,092.50
Western section:	
Around rapids of Rock River	547,229.93
Rock River division	25,470.21
Allotted for Rock River pool	21,500.00
Feeder junction to Rock River	1,917,357.93
Feeder line	1,590,046.30
Total	7,188,696.87

CONTRACTS IN FORCE DURING THE YEAR.

Name and address of contractor.	Nature of contract.	Date.	To expire—	Remarks.
Page & Shnable, Chicago, Ill.	Foundations and walls for locks and piers and abutments for bridges.	Aug. 11, 1902	Nov. 30, 1904	Time limit waived. Completed.
Do	Modifying terms of above contract.	Mar. 21, 1904		Completed.
Do	Excavating outlet from Lock 29 into Rock River.	May 11, 1906	Oct. 31, 1906	Do.
Wallace Marshall, La Fayette, Ind.	Superstructures of 21 steel highway bridges.	June 12, 1906	Dec. 1, 1906	Do.
Russel Wheel and Foundry Co., Detroit, Mich.	Emergency gates, sluice gates, etc.	Sept. 25, 1906	Contingent.	
Horace E. Horton, Chicago, Ill.	Hoisting carriages.	Nov. 13, 1906	May 31, 1906	Do.
Vulcan Iron Works, Chicago, Ill.	Metal work for gates and valves.	do	do	Do.
Russel Wheel and Foundry Co., Detroit, Mich.	Dec. 20, 1906; supplementary contract for 6 sluice gates.	Dec. 20, 1906	Contingent.	

All the above contracts pertain to construction of Illinois and Mississippi Canal.

APPENDIX N N.

IMPROVEMENT OF RIVERS AND HARBORS IN MICHIGAN ON THE EASTERN SHORE OF LAKE MICHIGAN.

REPORT OF COL. M. B. ADAMS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. St. Joseph Harbor and River, Michigan.
2. Harbor at South Haven, Michigan.
3. Harbor at Saugatuck and Kalamazoo River, Michigan.
4. Harbor at Holland (Black Lake), Michigan.
5. Harbor at Grand Haven, Michigan.
6. Grand River, Michigan.
7. Muskegon Harbor, Michigan.
8. Harbors at White Lake and Pentwater, Michigan.
9. Harbor at Ludington, Michigan.
10. Harbor at Manistee, Michigan.
11. Harbor of refuge at Portage Lake, Michigan.
12. Arcadia Harbor, Michigan.
13. Frankfort Harbor, Michigan.
14. Harbor at Charlevoix, Michigan.
15. Harbor at Petoskey, Michigan.

UNITED STATES ENGINEER OFFICE,
Grand Rapids, Mich., July 9, 1907.

GENERAL: I have the honor to submit herewith the annual report of works of river and harbor improvement under my charge for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

M. B. ADAMS,
Colonel, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

N N 1.

IMPROVEMENT OF ST. JOSEPH HARBOR AND RIVER, MICHIGAN.

(A) ST. JOSEPH HARBOR.

By soundings made May 14–18, 1907, the following available depths referred to the level of zero of gauge were ascertained: In front of the entrance, 20 to 23 feet; between the piers, 20 feet for a width of 200 feet in the outer reach and narrowing to 100 feet at the angle; inside, 20 feet in the south draw opening of the railroad

bridge, the north opening being unavailable for deep-draft vessels, thence to the mouth of the Benton Harbor Canal, 20 feet for a width of 60 to 70 feet, and 18 feet for a width of 50 to 180 feet; in the Benton Harbor Canal, a central depth of 16½ feet.

The U. S. dredge *Gillespie* began the work of restoring the required depth in the north draw opening of the railroad bridge and of widening the channel between the piers and inside as far as the mouth of the Benton Harbor Canal, on June 3, 1907, and completed the same June 25. An attempt was made to improve the approach to the United States light-house dock, but the available space was too restricted for the requirements of the *Gillespie*, and the attempt was abandoned. The quantity dredged was 56,427 cubic yards, and the amount expended during the fiscal year was $2,631.81, including contingencies.

An examination of the piers was made during September, 1906, to ascertain the condition of the stone filling, at a cost of $17.95.

(B) ST. JOSEPH RIVER.

The old dam closing the left channel of the river at Twin Springs Island was removed, and a new dam was built across the right channel. This was done because it was found that the expected scouring effect of the current in the right channel did not take place, and a better effect of the concentrated current in the left channel is anticipated. The cost of this work has been $296.75.

Money statements.

ST. JOSEPH HARBOR.

July 1, 1906, balance unexpended	$15,192.83
Amount appropriated by river and harbor act approved March 2, 1907	15,000.00
	30,192.83
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	2,649.76
July 1, 1907, balance unexpended	27,543.07
July 1, 1907, outstanding liabilities	1,300.00
July 1, 1907, balance available	26,243.07

ST. JOSEPH RIVER.

July 1, 1906, balance unexpended	$300.49
Amount appropriated by river and harbor act approved March 2, 1907	1,000.00
	1,300.49
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	296.75
July 1, 1907, balance unexpended	1,003.74
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 (Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.)	1,000.00

APPROPRIATIONS.

ST. JOSEPH HARBOR AND RIVER, MICHIGAN.

July 4, 1836		$20,000.00
March 3, 1837		15,000.00
July 7, 1838		51,113.00
March 3, 1843		25,000.00
June 11, 1844		20,000.00
August 30, 1852		10,000.00
June 28, 1864 (allotment)		15,000.00
June 23, 1866		6,000.00
March 2, 1867		23,000.00
Allotted from harbors on Northwestern Lakes, 1867	$7,500.00	
Transferred in 1870 to Grand Haven Harbor	500.00	
		7,000.00
July 11, 1870		15,000.00
March 3, 1871		10,000.00
June 10, 1872		3,000.00
June 23, 1874		2,000.00
March 3, 1875		35,000.00
August 14, 1876		12,000.00
June 18, 1878		12,000.00
March 3, 1879		$6,000.00
June 14, 1880		8,000.00
March 3, 1881		10,000.00
August 2, 1882		12,000.00
July 5, 1884		15,000.00
August 5, 1886		10,000.00
August 11, 1888		12,000.00
September 19, 1890		20,000.00
July 13, 1892		59,000.00
August 18, 1894		30,000.00
June 3, 1896		30,000.00
March 3, 1899		50,000.00
June 6, 1900		253,950.00
March 3, 1901		38,000.00
June 13, 1902		23,250.00
March 3, 1905		15,000.00
March 2, 1907		15,000.00
Miscellaneous receipts		1,027.65
Total		889,340.65
Amount carried to surplus fund, 1856		.80
Balance		889,339.85

ST. JOSEPH RIVER, MICHIGAN.

August 11, 1888	$2,500.00
September 19, 1890	1,000.00
July 13, 1892 (allotment)	1,000.00
August 18, 1894	500.00
June 3, 1896	500.00
June 13, 1902	$750.00
March 2, 1907	1,000.00
Total	7,250.00

CONTRACT IN FORCE.

COAL FOR U. S. DREDGE "GILLESPIE."

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia Crown Hill, $3.10 per ton; Youghiogheny, $3.25 per ton; Hocking Valley, $2.95 per ton; Saginaw, $3 per ton; Pittsburg, No. 8, $2.85 per ton.

COMMERCIAL STATISTICS FOR ST. JOSEPH HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statements furnished by the deputy collectors of customs at St. Joseph and Benton Harbor, Michigan.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	1,279	922,411
Sail	44	4,565
Total	1,323	926,976

Maximum draft: Harbor 20 feet, Benton Harbor Canal 16 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Merchandise, miscellaneous	33,839	Merchandise, miscellaneous	26,105
Flour	140	Merchandise, miscellaneous, and fruit	27,988
Lumber	9,561	Paper	30
Crushed stone	1,800	Flour	20
Paper	4	Coal	80
Cedar posts	1,080	Apples	180
Cedar ties	36	Potatoes	3
Shingles	662	Fruit	12,454
		Asparagus	92
		Vinegar	40
		Sugar	1,725
Total	47,122	Total	68,717

Total freight carried:	Tons.
1905	118,412
1906	115,839
Decrease	2,573

COMMERCIAL STATISTICS FOR ST. JOSEPH RIVER, MICHIGAN, CALENDAR YEAR 1906.

[Data furnished by Mr. W. H. Hull, St. Joseph, Mich.]

The steamers *May Graham* and *Tourist* carried 20,372 passengers and 2,034 tons freight, as compared with 23,377 passengers and 2,530 tons freight carried in 1905. The boats have a maximum draft of 3 feet.

N N 2.

IMPROVEMENT OF SOUTH HAVEN HARBOR, MICHIGAN.

Between July 7 and August 4, 1906, the U. S. dredge *Gillespie* deepened the channel through the outer bar to 20 feet, that between the piers to 17 feet, and the channel in the river to the upper turning basin to 16 feet. The quantity dredged was 53,468 cubic yards, and the cost of the work, including contingencies, was $5,850.93.

The channel again shoaled during the winter, and the available depths found by soundings made April 29–May 1, 1907, were as follows: Outside, 12.2 feet in front of the entrance, but 13.8 feet on the line of the North Pier, and 15.6 feet on the line of the South Pier; between the piers and in the river to the upper steamboat landing 14.2 feet in a narrow channel.

Dredging operations for the restoration of the required width and depth of channel through the outer bar and in the river were begun May 22 under the contract with Greiling Brothers, and completed June 22. They resulted in producing a channel 120 feet wide and 16 feet deep outside, and 60 feet wide and 16 feet deep in the river to the upper limit of the improvement. The quantity dredged was 26,321 cubic yards, and the price per cubic yard was 21½ cents. The amount expended during the year on the work, including contingencies, was $1,542.35, leaving $3,834.40 balance due contractor.

The depths given above refer to the level of zero of gauge. On June 29, 1907, the U. S. dredge *Gillespie* began operations for restoring the required width and depth of channel between the

piers and at the entrance, and removed 2,179 cubic yards on that day. The expenditures on this account have been $582.75, including contingencies.

The empty pockets in the projecting portions of the two piers were refilled with 98.24 cords stone by the Sturgeon Bay Stone Company, at a cost of $1,056.64, including contingencies.

Money statement.

July 1, 1906, balance unexpended	$44,957.81
Amount appropriated by river and harbor act approved March 2, 1907	40,000.00
	84,957.81
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	9,032.67
July 1, 1907, balance unexpended	75,925.14
July 1, 1907, outstanding liabilities	656.00
July 1, 1907, balance available	75,269.14
July 1, 1907, amount covered by uncompleted contracts	2,241.28
Amount (estimated) required for completion of existing project	248,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	5,000.00

APPROPRIATIONS.

March 2, 1867	$43,000.00	August 11, 1888	$10,000.00
July 11, 1870	10,000.00	September 19, 1890	15,000.00
March 3, 1871	15,000.00	July 13, 1892	10,000.00
June 10, 1872	12,000.00	August 18, 1894	20,000.00
March 3, 1873	20,000.00	June 3, 1896	15,000.00
June 23, 1874	10,000.00	March 3, 1899	45,000.00
March 3, 1875	10,000.00	June 6, 1900 (allotments)	3,300.00
August 14, 1876	10,000.00	June 13, 1902	12,000.00
June 18, 1878	12,000.00	June 13, 1902 (allotment)	5,000.00
March 3, 1879	7,500.00	March 3, 1905	50,000.00
June 14, 1880	5,000.00	March 2, 1907	40,000.00
March 3, 1881	5,000.00	Miscellaneous receipts	2,137.47
August 2, 1882	10,000.00		
July 5, 1884	7,500.00	Total	409,437.47
August 5, 1886	5,000.00		

CONTRACTS IN FORCE.

DREDGING.

Contractor: Greiling Brothers.
Date of contract: April 3, 1907.
Date of approval: April 15, 1907.
Date of beginning: May 2, 1907.
Date of expiration: October 2, 1907.
Work: Dredging for maintenance of channel, at 21½ cents per cubic yard.

COAL FOR U. S. DREDGE "GILLESPIE."

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia Crown Hill, $3.10 per ton; Youghiogheny, $3.25 per ton; Hocking Valley, $2.95 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $2.85 per ton.

COMMERCIAL STATISTICS FOR SOUTH HAVEN HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the deputy collector of customs at South Haven, Mich.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	667	601,688
Sail	4	574
Other craft	12	96
Total	683	602,358

Maximum draft, 14.2 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Merchandise, miscellaneous	33,793	Merchandise, miscellaneous	10,838
Lumber	2,160	Fruit	13,286
Total	35,953	Total	24,124

Total freight carried:	Tons.
1905	68,877
1906	60,077
Decrease	8,800

Passengers carried: Series of 1905, 267,060; series of 1906, 279,886; increase, 12,826.

During the year the Michigan Steamship Company ceased doing business at this port.

N N 3.

IMPROVEMENT OF HARBOR AT SAUGATUCK AND KALAMAZOO RIVER, MICHIGAN.

Persons locally interested vehemently urged the opening of the new channel without waiting the construction of revetments along the deep cut that had been made out of Kalamazoo River almost to water line in Lake Michigan and before the piers had been extended more than 100 feet within the shore line over a low beach; it was therefore with misgivings that a contract was made March 21, 1906, with the Great

Lakes Dredge and Dock Company, for cutting away the intervening barrier between Kalamazoo River and Lake Michigan. One cut through the barrier was completed June 30, 1906, making the channel available to commerce, and the contract was completed September 6, 1906. The quantity dredged from July 1 to September 6 was 40,902 cubic yards. Of this quantity 293 cubic yards consisted of stone, and this was deposited as riprap along the lake face of the north pier. The contract price was 16.9 cents per cubic yard, and the total expenditure since July 1 was $11,107.63, including contingencies.

In order that the 14-foot depth of channel provided under contract might be deepened so that annual accretion would not prevent the United States dredge *Gillespie* from maintaining that depth, authority was obtained to operate the United States dredge with this end in view. Operations were commenced with the *Gillespie* September 21 and by October 8 a channel of full width and almost 16 feet deep had been completed. This dredge went to its coaling place at Holland Harbor, October 8, and on returning to Saugatuck Harbor, October 10, found that a storm in the meantime had caused breaches around the inner ends of both piers and had carried so much sand into the channel as to preclude further operations. The quantity dredged by the *Gillespie* between September 21 and October 8 was 35,282 cubic yards, at a cost of $3,459.50, including contingencies.

Anticipating some such state of affairs, allotments from the emergency appropriation June 13, 1902, and March 3, 1905, $4,700 and $10,000, respectively, had been secured for the purpose of constructing revetments that would extend the piers shoreward. A contract was made August 17, 1906, with Bennett-Schnorbach Company for 200 feet of revetment extensions to each pier. Construction was commenced September 14, 1906; was suspended, owing to severe weather, December 18, 1906; was resumed May 6, 1907, and completed June 18, 1907. The cost of this work was $8,877.11, including contingencies.

Soon after the present district engineer took charge of the district (April 30, 1903), he forwarded bids, opened June 18, 1903, under specifications that had been prepared prior to his assuming charge, and in doing so expressed himself as follows:

> In recommending the lowest bid for acceptance I desire to respectfully invite notice to the fact that the pile-work portions of the piers are to extend about 1,200 feet from shore line and according to the latest survey will be partly in 15 feet of water; and in considering that the stone filling as provided does not reach the level of the superstructure, it will be dependent on the holding power of the bolting for its stability, which may not prove adequate to resist the force of the seas. *It seems probable that some repairs will be required to the superstructure in a short time after the pile piers are built* and that more stone filling will eventually be required.

Repairs to the piers were required, as anticipated, and a section of 90 feet at the inner end of the south pile pier was so much injured when the breach around that pier occurred that this section now requires renewal. A total of 700.7 cords of stone were purchased and delivered at the piers, 600.7 as additional filling to the piers, and 100 for riprapping the outer end of the south pier. Of the stone used for refilling the piers 163.76 cords were placed during the previous

fiscal year. The cost of this work was $5,182.51, including contingencies.

The condition of the channel on April 12–18, when soundings were made, was as follows: In the outer approach 17.1 feet on the line of the north pier, 15.9 feet in front of the entrance, and 20.9 feet on the line of the south pier; between the piers 17.7 feet at the outer end, 10.4 feet 400 feet inside, and 3.8 feet at the inner end; in the channel from the piers to Kalamazoo River 6 feet for a width of 50 feet 300 feet inside of the end of the north pier and 14.6 feet farther inside. The available depth in the river above the new channel was generally 14 feet, except about halfway to Saugatuck, where there was only 12.6 feet.

Dredging for the restoration of the needed depth in the new channel was begun June 18 under the contract with Greiling Brothers, dated April 3, 1907, and at the end of the month 7,594 cubic yards had been removed, at a price of 15.8 cents per cubic yard. The expenditures during the fiscal year on account of this contract have been $356.63, being for engineering contingencies. The depths stated above refer to the level of zero of gauge.

The Chicago and South Haven Line, at its expense, had a dredge cut 30 feet wide made through the shoals in Kalamazoo River to enable their boats drawing 12 feet to reach their dock in Saugatuck.

Under date of May 25, 1907, bids were invited by public advertisement for the construction of sheet-pile revetments for the interior reach of the new channel to Kalamazoo River and for repairing the inner end of the south pier. The bids were opened June 24, and recommendation was made for the award of the contract to the lowest bidder, Mr. Robert Love.

Money statement.

July 1, 1906, balance unexpended		$36,788.74
Allotment from appropriation for emergencies, act June 13, 1902		4,700.00
Allotment from appropriation for emergencies, act March 3, 1905		10,000.00
Amount appropriated by river and harbor act approved March 2, 1907		75,000.00
		126,488.74
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$23,283.77	
For maintenance of improvement	9,020.64	
		32,304.41
July 1, 1907, balance unexpended		94,184.33
July 1, 1907, amount covered by uncompleted contracts		9,480.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907		14,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

Date.	Saugatuck Harbor.	Kalamazoo River.	Total.
July 25, 1868 (allotment)	$23,900		$23,900
April 10, 1869 (allotment)	6,039		6,039
July 11, 1870	10,000		10,000
March 3, 1871	10,000		10,000
June 10, 1872	15,000		15,000
March 3, 1873	10,000		10,000
June 23, 1874	10,000		10,000
March 3, 1875	10,000		10,000
August 14, 1876	3,000		3,000
June 18, 1878	2,500		2,500
March 3, 1879	5,000		5,000
June 14, 1880	5,000		5,000
March 3, 1881	5,000		5,000
August 2, 1882	8,000		8,000
July 5, 1884	4,000		4,000
August 5, 1886	8,000		8,000
August 11, 1888	5,000		5,000
July 13, 1892	5,000		5,000
August 18, 1894	12,000		12,000
June 3, 1896	10,000	$5,000	15,000
March 3, 1899	7,000	10,000	17,000
June 6, 1900 (allotments)	7,500		7,500
June 13, 1902	15,000		15,000
June 13, 1902 (allotment)	5,300		5,300
March 3, 1903		100,000	100,000
March 3, 1905	15,000	60,000	75,000
June 13, 1902 (allotment)			4,700
March 3, 1905 (allotment)			100,000
March 2, 1907			75,000
Total	217,239	175,000	481,939

CONTRACTS IN FORCE.

DREDGING.

Contractor: Great Lakes Dredge and Dock Company.
Date of contract: March 21, 1906.
Date of approval: April 3, 1906.
Date of beginning: April 20, 1906.
Date of expiration: July 5, 1906. (Time limit waived.)
Rate: 16.9 cents per cubic yard, scow measurement, except a portion of barrier which is to be spoil-bank measurement under provisions of supplemental contract dated April 21, 1906.
Work: Opening new cut between Kalamazoo River and Lake Michigan.

Contractor: Greiling Brothers.
Date of contract: April 3, 1907.
Date of approval: April 15, 1907.
Date of beginning: May 2, 1907.
Date of expiration: August 2, 1907.
Rate: 15.8 cents per cubic yard, scow measurement, and 15 cents spoil-bank measurement.
Work: Dredging for maintenance of new channel from Lake Michigan to Kalamazoo River.

EMERGENCY CONTRACT FOR STONE.

Contractors: Leathem & Smith Towing and Wrecking Company.
Date of contract: July 10, 1905.
Date of beginning: April 21, 1906.
Date of expiration: July 7, 1906. (Time limit waived.)
Work: Furnishing, delivering, and putting in place 800 cords stone, more or less, at $6.87½ per cord.

EMERGENCY CONTRACT FOR CONSTRUCTION OF SHEET PILE REVETMENTS.

Contractor: Bennett-Schnorbach Company.
Date of contract: August 17, 1906.
Date of beginning: August 27, 1906.
Date of expiration: December 31, 1906. (Time limit waived.)
Rates: Round oak piles, 30 cents per linear foot; oak timber, $49 per thousand; pine or Douglas fir timber, $33.90 per thousand; pine or Douglas fir plank for sheet piles, $49 per thousand; pine or Douglas fir plank for decking, $34 per thousand; driftbolts, 4 cents per pound; screw bolts, tie-rods, carriage bolts, and spikes, 4½ cents per pound.

COMMERCIAL STATISTICS FOR SAUGATUCK HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from a statement furnished by Mr. R. Colborn Brittain, at Saugatuck, Mich.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	938	141,828
Sail	50	12,800
Total	988	154,628

Maximum draft, 6 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Lumber	3,500	Fruit	10,000
Coal	500	Merchandise, miscellaneous	2,500
Merchandise, miscellaneous	5,000		
Total	9,000	Total	12,500

Total freight carried:	Tons.
1906	21,500
1905	8,425
Increase	13,075

New lines of transportation established.

South Haven and Chicago Line, terminal points Saugatuck and Chicago.

N N 4.

IMPROVEMENT OF HARBOR AT HOLLAND, MICHIGAN.

Work under the continuing contract with Macdonald & Beauvais for the construction of the piers for the outer expansion basin, which was begun in the previous fiscal year, was continued. It progressed satisfactorily until October 8, when a violent storm did great damage to the new crib work in position in the North Pier, which consisted of 600 linear feet of completed substructure and more than one-half of four courses of superstructure, all filled with stone to the top. The damage was increased by the succeeding storms, particularly those of October 24–25 and of October 28–29, and the condition of

the work at the end of October was as follows: For a length of about 400 feet the work had been pushed south, the maximum horizontal displacement at the top being 5.3 feet, and a settlement had taken place amounting to 1.6 feet in the south wall in the worst place; the foundation piles under 200 linear feet of the north wall were found standing clear of the cribs; 14,614 feet B. M. timber had been lost from the superstructure. The amount of stone lost from the work either from on top or through the bottom by the various storms was estimated at about 350 cords. The contractors made strenuous efforts to secure the work by repairing the injured portions and refilling and riprapping the cribs and no further damage occurred to it, but a fatal disaster befell a working party on the pier on November 21, when an unusually sudden and violent storm prevented their return to shore, and the United States assistant inspector, the managing agent of the contractors, and two laborers lost their lives. Operations were suspended December 18, 1906, for the winter and resumed April 1, 1907. At the end of the fiscal year there had been placed in the North Pier one 100 by 30 by 20½ foot crib, two 100 by 24 by 18½ foot cribs, and three 100 by 24 by 16½ foot cribs, and portions of the six courses of superstructure, varying in length from 493 feet in the bottom course to 308 feet in the top course had been built, and the work was well filled with stone. The outer 500 feet of the structure had been riprapped with 293.3 cords heavy stone. The last crib for the North Pier, 150 by 24 by 16½ feet, has been built and its foundation has been prepared.

The experience with the narrow cribwork on the north pier during the fall storms made it appear advantageous to increase the width of the cribs still to be built for the south pier to 30 feet, and a supplementary contract to this effect was therefore entered into with Macdonald & Beauvais. According to this contract the seven outermost cribs of the south pier are to be 30 feet wide. The construction of the crib intended for the inner end was already too far advanced to admit of a change in its width. In addition the supplementary contract provides for thoroughly riprapping the new cribwork in both piers for its entire length.

At the end of the fiscal year one crib 100 by 30 by 18½ feet had been sunk in the south pier on its pile foundation, the construction of two other cribs was completed, and that of two more well advanced, and the foundation piles for one and part of those for another one of these cribs had been driven.

The amount expended for the work under this contract during the fiscal year was $55,011.63, including contingencies.

Under an emergency contract with the Bennett-Schnorbach Company, the north pile pier between the angle and the east end was strengthened with 67 piles driven along the rear wall and secured to the same with screw bolts, and the closing dam back of the north pier at shore line was repaired and extended across the enlarged gap with sheet piles and stone. The cost of these repairs was $1,944.32, including contingencies.

The following repairs were made with day labor and purchased material: At the present outer end of the old north pier the outer end wall of the substructure was repaired and the substructure refilled and decked with 12 by 12 inch timber for a distance of 7 feet to the outer end of the superstructure, and the latter was restored to a serv-

iceable condition, filled with stone, and decked over. The break in the front wall of the south pier between stations 1+30.5 and 1+62.5, caused by the steamer *Argo*, April 24, 1905, was repaired, and a number of screw bolts and tie-rods in the pile work of the two piers were tightened up. The expenditures on account of these repairs were $787.05, including contingencies.

The channel between and in front of the piers was dredged by the U. S. dredge *Gillespie* between October 11 and 13, between November 5 and 16, 1906, and between April 4 and 22, 1907. The total quantity dredged on these three occasions was 61,081 cubic yards, at a cost of $5,873.71, including contingencies. Soundings made May 23–24 showed an available depth outside of the entrance of 17.3 feet, and between the piers 15.6 feet.

Bids have been invited by public advertisement dated June 26 for rebuilding the north pier between station 5+44 and the angle, a distance of about 720 feet. The bids are to be opened July 26. The amount of $39.21 was expended on contingencies.

Money statement.

July 1, 1906, balance unexpended		$137,675.14
Amount appropriated by river and harbor act, March 2, 1907		138,452.00
Amount appropriated by sundry civil act approved March 4, 1907		40,000.00
		316,127.14
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$55,011.63	
For maintenance of improvement	8,644.29	
		63,655.92
July 1, 1907, balance unexpended		252,471.22
July 1, 1907, amount covered by uncompleted contracts		120,883.20
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907		8,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPIATIONS.

Black Lake:	
August 30, 1852	$8,000.00
June 23, 1866	55,615.31
March 2, 1867	51,000.00
July 11, 1870	10,000.00
March 3, 1871	10,000.00
June 10, 1872	10,000.00
March 3, 1873	12,000.00
June 23, 1874	15,000.00
March 3, 1875	15,000.00
August 14, 1876	15,000.00
June 18, 1878	10,000.00
March 3, 1879	6,000.00
June 14, 1880	6,000.00
March 3, 1881	6,000.00
August 2, 1882	10,000.00
July 5, 1884	15,000.00
August 5, 1886	5,000.00
August 11, 1888	5,000.00
September 19, 1890	10,000.00

Holland:	
July 13, 1892	$5,000.00
August 18, 1894	15,000.00
June 3, 1896	10,000.00
March 3, 1899	37,500.00
June 6, 1900 (allotments)	4,200.00
June 13, 1902	73,000.00
March 3, 1905	65,000.00
March 3, 1905 (allotment)	10,000.00
June 30, 1906	70,000.00
March 2, 1907	138,452.00
March 4, 1907	40,000.00
Miscellaneous receipts	1,100.00
Total	743,867.31
Amount carried to surplus fund	1.19
Balance	743,866.12

CONTRACTS IN FORCE.

EXTENSION OF PIERS (CONTINUING CONTRACT).

Contractors: Macdonald & Beauvais.
Date of contract: October 11, 1905.
Date of approval: October 21, 1905.
Date of beginning: April 15, 1906.
Date of expiration: December 31, 1907.

Rates: Dredging for crib foundations, 25 cents per cubic yard; foundation piles, 50 cents per linear foot; oak guard piles, 40 cents per linear foot; piles for pile structures, 50 cents per linear foot; oak timber, $50 per thousand; white, Norway or Southern pine, or Oregon fir timber, $32.50 per thousand; hemlock timber, $23.50 per thousand; white, Norway or Southern pine, or Oregon fir planks, $31 per thousand; drift bolts, screw bolts, tie-rods, and spikes, 3 cents per pound; stone, $6 per cord.

Supplemental contract dated March 5, 1907, provided that 6 of the cribs to be placed in the south pier shall be made 30 feet wide instead of 24 feet, and that both sides and ends of both pier extensions for their full length shall be riprapped.

Rates for extra material: Foundation piles, 50 cents per linear foot; hemlock timber, $35 per thousand; pine or Oregon fir timber, $50 per thousand; pine or Oregon fir planks for decking, $42 per thousand; drift bolts and spikes, 5 cents per pound; stone for foundation and filling, $8.50 per cord; stone for riprap, $11 per cord; extra cost of replacing 28-foot, 26-foot, and 24-foot by 34-foot, 32-foot, and 30-foot hemlock cross-ties, $6.50 per thousand; extra cost of replacing 24-foot by 30-foot pine or Oregon fir cross-ties, $12.50 per thousand.

EMERGENCY CONTRACT FOR REPAIRS TO NORTH PIER.

Contractor: Bennett-Schnorbach Company.
Date of contract: September 28, 1906.
Date of beginning: October 4, 1906.
Date of expiration: November 3, 1906.

Rates: 67 oak piles, 20 to 25 feet long, $14 each; 75 triple sheet piles, 10 feet long, $10 each; 15 cords 200-pound stone, $12 per cord.

COAL FOR U. S. DREDGE "GILLESPIE."

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.

Rates: West Virginia Crown Hill, $3.20 per ton; Youghiogheny, $3.35 per ton; Hocking Valley, $3.05 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $2.95 per ton (with a reduction of 10 cents per ton after season opens and agent is there).

COMMERCIAL STATISTICS FOR HOLLAND (BLACK LAKE) HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the Graham & Morton Line, of Holland, Mich.]

Vessels entered and cleared.

Character—	Number.	Tonnage.
Steam	772	800,540
Sail	24	2,660
Total	796	803,200

Maximum draft, 15.6 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Merchandise, miscellaneous	63,062	Merchandise, miscellaneous	94,779
Railroad ties	526		
Cedar posts	176		
Shingles	352		
Lumber	493		
Lath	135		
Wood	88		
Stone	375		
Total	65,207	Total	94,779

Total freight carried:	Tons.
1906	159,986
1905	149,188
Increase	10,798

N N 5.

IMPROVEMENT OF GRAND HAVEN HARBOR, MICHIGAN.

The repairs of the break in the north pier caused by the steamer *Hackley* June 5, 1905, and of the break in the south pier caused by the steamers *Atlanta* and *Indiana* in April and October, 1904, were completed in August, 1906. They had been begun in the previous fiscal year, and were made with day labor and purchased material. About 800 feet of plank walk on the south pier were also repaired. The expenditures during the fiscal year on acount of these repairs amounted to $1,269.95, including contingencies.

The contract with the Leathem & Smith Towing and Wrecking Company for refilling parts of the piers was completed in July, 1906, by the delivery of 55.45 cords of stone in various parts of the south pier at a cost of $1,134.49, including contingencies and payment of retained per cents.

Between December 21 and 27, 1906, the U. S. dredge *Gillespie* restored a depth of 21 feet on the crossing of the outer bar and reduced a shoal in the middle of the river opposite the Grand Trunk Railroad dock, on which there had been a depth of 13 feet, to 16.5 feet. The total quantity dredged was 11,552 cubic yards, of which 8,117 yards were removed from the bar, and the cost of the work was $1,091.64, including contingencies.

The sum of $76.07 was expended upon this spring's survey, which is chargeable to the U. S. dredge *Gillespie*.

The available depth on May 28–29, 1907, was 20 feet outside and between the piers. The depths stated above refer to the level of zero of gauge.

The United States property at the harbor has been in charge of a watchman throughout the year.

Money statement.

July 1, 1906, balance unexpended	$25,199.96
Amount appropriated by river and harbor act approved March 2, 1907	50,000.00
	75,199.96
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	3,572.15
July 1, 1907, balance unexpended	71,627.81
July 1, 1907, outstanding liabilities	34.00
July 1, 1907, balance available	71,593.81
Amount (estimated) required for completion of existing project	40,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:	
For works of improvement	$40,000.00
For maintenance of improvement	10,000.00
	50,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

August 30, 1852 (mouth of Grand River)	$2,000.00	August 2, 1882	$40,000.00
June 23, 1866	65,000.00	July 5, 1884	50,000.00
March 2, 1867 (mouth of Grand River)	40,000.00	August 5, 1886	30,000.00
April 10, 1869 (allotment)	1,866.15	August 11, 1888	25,000.00
July 11, 1870	10,000.00	September 19, 1890	75,000.00
1870 (allotment)	500.00	July 13, 1892	90,000.00
March 3, 1871	6,000.00	August 18, 1894	25,000.00
June 10, 1872	15,000.00	June 3, 1896	20,000.00
March 3, 1873	75,000.00	March 3, 1899	10,000.00
June 23, 1874	50,000.00	June 13, 1902	10,000.00
August 14, 1876	15,000.00	June 13, 1902 (allotment)	10,000.00
June 18, 1878	15,000.00	April 28, 1904 (allotments)	50,000.00
March 3, 1879	9,000.00	March 3, 1905	30,000.00
June 14, 1880	50,000.00	March 2, 1907	50,000.00
March 3, 1881	50,000.00	Miscellaneous receipts	5,576.92
		Total	924,943.07

CONTRACTS IN FORCE.

Contractor: Leathem & Smith Towing and Wrecking Company.
Date of contract: August 14, 1905.
Date of approval: August 26, 1905.
Date of beginning: September 13, 1905.
Date of expiration: December 1, 1905. (Time limit waived.)
Work: Furnishing, delivering, and placing about 1,312 cords of stone filling and riprap at $5.93 per cord.

COAL FOR U. S. DREDGE GILLESPIE.

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia Crown Hill, $3.10 per ton; Youghiogheny, $3.25 per ton; Hocking Valley, $2.95 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $2.85 per ton.

COMMERCIAL STATISTICS FOR GRAND HAVEN HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the collector of customs at Grand Haven, Mich.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	1,473	1,842,456
Sail	11	356
Other craft	6	126
Total	1,490	1,842,938

Maximum draft, 20 feet.

Receipts and shipments by vessel, 1906.

Articles.	Tons.
RECEIPTS.	
Bran	7,313
Barley	18,093
Beer	2,461
Corn	18,663
Cement	1,526
Eggs	192
Flour	54,379
Feed	24,001
Grain	1,223
Iron ore	40,200
Linseed oil	132
Leather	4,181
Lumber	22,586
Malt sprouts	513
Malt	28,960
Middlings	1,600
Meats	5,438
Machinery	983
Oats	24,134
Oil cake	289
Peas	419
Rye	1,494
Rags	139
Soap	181
Stone	7,000
Seed	121
Sheep	134
Miscellaneous freight	34,806
Vinegar	158
Wheat	618
Total	302,267
SHIPMENTS.	
Asbestos refuse	420
Asbestos fiber	3,394
Apples	556
Bleach	1,396
Beer	137
Boilers	738
Bark extract	3,819
Beans	431
SHIPMENTS—continued.	
Building stone	171
Brimstone	249
Coal	14,976
Coffee	1,079
Cement	2,446
Charcoal	200
Caustic soda	105
Clay	171
China clay	1,317
Copper	208
Cider	141
Flour	337
Fish	146
Granite	978
Grease	107
Glass	841
Hides	3,602
Iron, pig	161
Lumber	954
Molding sand	1,008
Machinery	419
Myrobolans	389
Mangrove bark	135
Oil	201
Oil creosote	732
Plaster	101
Pulp	9,867
Potatoes	134
Paper	111
Paving blocks	2,658
Radiators	266
Rice	132
Salt	4,011
Sugar	1,829
Stucco	168
Soda ash	300
Sulphur ore	156
Saltpeter	166
Miscellaneous freight	50,251
Vinegar	154
Brick	193
Total	112,461

Total freight carried:	Tons.
1906	414,728
1905	382,373
Increase	32,355

N N 6.

IMPROVEMENT OF GRAND RIVER, MICHIGAN.

At the end of June, 1906, the suction dredge *Ludlow* was at work on Bridge Street bar, station 798, mile 15, and continued there until July 12, when the 100-foot channel was completed to station 826, except between stations 820 and 823, only 75 feet wide, and between stations 823 and 824, only 87 feet wide, the material being too hard to dredge the full width. This completed a channel 100 feet wide, 6 feet deep, and 9,600 feet long between stations 730 and 826 the whole length of the bar, except as noted above. July 13 to 28 a channel was dredged 100 feet wide, 6 feet deep, and 2,800 feet long, between stations 558 and 586 on Haires bar, mile 11. July 30 to August 6 a channel was dredged 100 feet wide, 6 feet deep, and 1,000 feet long, between stations 466 and 476 on Mack's bar, mile 9, except between stations 469+60 and 472, only 75 feet wide, hard material making it impossible to dredge the full width. August 7 to September 12 a channel was dredged 50 feet wide, 6 feet deep, and 1,000 feet long between stations 348 and 358, and 100 feet wide, 6 feet deep, and 2,900 feet long between stations 358 and 387 on Snyder bar, mile 7, except between stations 381+80 and 387, which could not be dredged full width on account of very hard material. Much trouble was experienced on Snyder bar on account of the depth of water being less than the draft of the dredge, about 34 inches at bow (the style of dredge being such that it can not dredge beyond its bow) and also on account of the space back of the training walls becoming filled and the dredged material running back into the channel. This bar had been dredged, between stations 362 and 382, about 70 feet wide, in August to October, 1904. September 12 to October 12, 1906, a channel was dredged 100 feet wide, 6 feet deep, and 4,600 feet long, between stations 395 and 441, on Boynton bar. October 13 to 30, 1906, a channel was dredged 100 feet wide, 6 feet deep, and 4,200 feet long, between stations 596 and 638, Sand Creek bar. Dredging for the season closed October 30, and the plant arrived at winter quarters at Grand Haven, October 31, where general repairs were made during the winter. May 10, 1907, the dredge left Grand Haven, and dredging for the season was begun May 14, on Spoonville bar, mile 29, where a channel was dredged 100 feet wide, 6 feet deep, and 1,070 feet long. May 17 to 21, a channel was dredged 100 feet wide, 6 feet deep, and 1,030 feet long on Robinson bar, mile 27. The dredged channel on both of these bars runs diagonally downstream across the river from deep water along left bank to deep water along right bank. This is the first dredging ever done below the mouth of Bass River, mile 23. May 22 to 25, a channel was dredged 100 feet wide, 6 feet deep, and 950 feet long between stations 1142 and 1133, on County House bar, mile 21½. May 27 to 28, the crossing for Cooleys Ferry, mile 19.4, was dredged, and May 29 to 31, the crossing for Lamont Ferry, mile 16.7, was dredged. The plant was then moved to Howlett bar, mile 4, where work was continued throughout June, a channel being dredged 100 feet wide and 2,530 feet long between stations 178 and 202, and 75 feet wide and 1,590 feet long between stations 202 and 218; from station 178 to 192 the channel

is 6 feet deep, and from station 192 to 202, from 4.5 feet to 6 feet deep, the material being too hard to get the full depth of 6 feet. During the year this dredge has removed 292,412 cubic yards of sand, mud, clay, and gravel, and 406 snags.

At the end of June, 1906, the dipper dredge *Farquhar* was at station 106, Noble bar, mile 2, and continued there until July 5, completing a single cut 28 feet wide, 8 feet deep, and 423 feet long to station 110+15. July 5 to 10 the dredge was moved to Fulton street, at the head of navigation, and made a temporary cast-over cut, widening the channel at boat slip of Grand River Boat Line for relief of their steamers. Later in the season this cast-over material was removed from mid-channel and deposited ashore by the *Saginaw*. The *Saginaw* conveyor was completed and began work July 17, 1906, conveying the material from dredge to spoil bank. July 11 to October 22 the single cut of last year was widened, giving the channel two cuts wide (about 60 to 70 feet wide) from the Grand River Boat Line landing at Fulton street, station —25+50 to station +21+50, a distance of about 4,600 feet. This channel is three cuts wide at three places, viz, at the boat landing, just above the Pere Marquette Railroad Bridge, and just below the Wealthy Avenue Bridge. Much of this material was shale rock in place and bowlders, making it very difficult to dredge. October 22 to 25 cut 1, Plaster Creek bar, mile 1½, was dredged between stations 78 and 80, 200 feet (this had been omitted last June). The plant then started for winter quarters, and after much delay, due to shoal water on Howlett bar, mile 3¾, reached Grand Haven October 30. General repairs were made to the *Farquhar* during the winter. April 25, 1907, the *Farquhar* left Grand Haven, and work for the season was begun April 29 on Glen Creek bar, mile 5. April 29 to May 20 a cast-over cut was made along right wall, or bank, a distance of 2,145 feet between stations 255+70 and 276+67. May 18 the *Saginaw* conveyor left Grand Haven and arrived at mile 5 May 20. May 21 to June 15 cut 2 was dredged parallel and adjacent to cut 1, a distance of 1,975 feet, between stations 255+70 and 274+94. This, with cut 1, makes an available channel through what was one of the worst bars. June 17 to 30 the plant worked on Noble bar, mile 1¾; cut 1 of last season was redredged for a distance of 815 feet between stations 88+80 and 91+60 and between stations 99+20 and 104+75, while repairs were being made to *Saginaw*, and then cut 2, parallel and adjacent to cut 1 of last season, was dredged a distance of 1,217 feet between stations 88 and 100+85. The amount of material removed by the *Farquhar* and *Saginaw* during the year was 73,144 cubic yards, of which 9,340 cubic yards consisted of sand and clay, 49,455 cubic yards gravel and bowlders, and 14,349 cubic yards hardpan and shale. In addition, 120 snags were removed.

At the close of work November 1, 1905, the channel was practically completed 100 feet wide and 6 feet deep (below low water of 1889) from station 832, mile 15¾, to station 1214, mile 23, mouth of Bass River. At the close of work November 1, 1906, the following sections showed a practically completed channel, except as noted above in regard to Snyder and Macks bars: Mile 7-9, stations 358 to 478, 12,400 feet; mile 10, stations 524 to 538, 1,400 feet; mile 11-12,

stations 552 to 638, 8,600 feet; mile 14-15, stations 708 to 832, 12,600 feet, making a total of 35,000 feet.

In addition to the above a completed channel has been dredged this spring, mile 4, stations 178 to 192, 1,400 feet.

The plant for use on contraction work left Grand Haven July 18, 1906, and work was begun on walls 76 and 80, Snyder bar, mile 7. The object in view throughout the season was to put the walls in repair where it was expected to dredge with the suction dredge *Ludlow*, the walls being required to keep the dredged material from running back into the channel. Repairs were made to old walls by driving piles where missing, refilling in places with brush fascines, placing poles or riders on top of fascines, binding piles and poles at top with wire and cutting off tops of high piles.

The work of rebuilding U. S. tug *Gillmore*, which was under way at the close of fiscal year, was completed. The tug was launched July 30, 1906, and placed in commission August 28.

The amounts expended during the fiscal year were as follows:

Dredging	$25,256.11
Contraction works	9,970.44
Converting dredge *Saginaw* into conveyor	2,131.61
Rebuilding tug *Gillmore*	3,345.83
Surveys	587.69
Superintendence, inspection, and contingencies	5,063.03
Flood work	508.78
Total	46,863.49

Of the above amount the sum of $10,086.02 was expended for maintenance, $9,460.12 for contraction work, and $625.90 on completed 6-foot channel.

Money statement.

July 1, 1906, balance unexpended		$58,438.88
Deposited by city of Grand Rapids, Mich		292.50
Amount appropriated by river and harbor act approved March 2, 1907		88,000.00
		146,731.38
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$36,777.47	
For maintenance of improvement	10,086.02	
		46,863.49
July 1, 1907, balance unexpended		99,867.89
July 1, 1907, outstanding liabilities		2,015.00
July 1, 1907, balance available		97,852.89
Amount (estimated) required for completion of existing project		149,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$80,000.00	
For maintenance of improvement	20,000.00	
		100,000.00
Submitted in compliance with the requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

March 3, 1881	$10,000.00	March 3, 1905	$100,000.00
August 2, 1882	15,000.00	March 2, 1907	88,000.00
July 5, 1884	25,000.00	Miscellaneous receipts	376.15
June 3, 1896	50,000.00		
March 3, 1899	75,000.00	Total	513,376.15
June 13, 1902	150,000.00		

CONTRACT IN FORCE.

COAL FOR UNITED STATES GRAND RIVER DREDGES.

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.

Rates: F. o. b. Government scow at Grand Rapids, West Virginia Crown Hill, $3.55 per ton; Youghiogheny, $3.55 per ton; Hocking Valley, $3.40 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $3.10 per ton.

Rates: F. o. b. Government scow at landing at Grandville, Mich., West Virginia Crown Hill, $3.55 per ton; Youghiogheny, $3.55 per ton; Hocking Valley, $3.40 per ton; Saginaw, $3.25 per ton; Pittsburg No. 8, $3.15 per ton.

COMMERCIAL STATISTICS FOR GRAND RIVER, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statements furnished by Mr. L. W. Goddard, assistant engineer, Grand Haven, Mich., and the Grand Rapids and Lake Michigan Transportation Company, of Grand Rapids, Mich.]

Freight carried on Grand River, 1906.

	Tons.
Baskets	43
Berry crates and fillers	28
Gravel	46,075
Logs	9,906
Salt	21
Wood	305
Iron ore [a]	51,606
Merchandise, miscellaneous	2,411
Total	110,395
Total freight carried:	
1906	110,395
1905	77,217
Increase	33,178

The Grand Rapids and Lake Michigan Transportation Company's two steamers, the *Grand* and the *Rapids*, made regular trips on the river until October 6, 1906. May 2, 1907, the *Grand* began running, making a round trip daily from Grand Haven to Grand Rapids. June 16, 1907, the *Rapids* began running for the season.

[a] To Fruitport, Mich.

N N 7.

IMPROVEMENT OF MUSKEGON HARBOR, MICHIGAN.

Work under the contract with Robert Love for restoring the revetment of the south bank of the channel for a distance of 307.8 feet and for the construction of 2,000 linear feet of the new north pier and revetment, involving the removal of 328 linear feet of cribwork in the converging portion of the old north pier and its restoration in the new pier, which had been commenced in the previous fiscal year, was continued until December 1, suspended on that day on account of winter weather, and resumed May 1. In the south revetment the third and fourth courses of superstructure were built, the sand filling was put in, and the plank walk was placed. This part of the contract was completed in September. In the work on the north pier the removal of the old cribwork was completed, and all the cribs were resunk in their new position, completed with three courses of new superstructure, filled with stone, and decked over. The length of this cribwork in the new position is 329.8 feet. In the 1,670 linear feet of sheet pile work all the round piles of the front and rear walls and the sheet piles with the corresponding upper guide and binding timbers were put in place, the front and rear walls were completed, 1,550 linear feet of the work received the tie-rods, the first course of the superstructure was completed for a length of 1,528 feet, the second course for a length of 1,510 feet, the third course for a length of 1,488 feet, the fourth course for a length of 1,470 feet, and the plank walk for a length of 488 feet. The expenditures on account of this contract during the year, including contingencies, were $32,653.56 for construction and $5,464.72 for maintenance.

Under a special agreement with Robert Love the vacancies in the outer end pockets of both piers and in a portion of the south pier were refilled with 138.36 cords stone at a cost of $1,172.24, including contingencies.

Between December 11 and 19 and again between April 1 and 3 the U. S. dredge *Gillespie* restored the required depth through the shoal which had formed in the channel between the piers near shore line. The total quantity dredged on the two occasions was 20,517 cubic yards, and the cost was $3,871.83, including contingencies.

Soundings made June 3 to 6 showed the following available depths, referred to the level of zero of gauge: Outside, on the line of the north pier, 18.8 feet, and opposite the southern half of the entrance, 22 feet; between the piers, at the outer end, 21 feet; near shore line, 18 feet for a width of 70 feet, and thence to the inner lake 17 feet for a width of not less than 70 feet.

Under date of April 17, 1907, a contract was entered into with Nelson J. Gaylord for repairing 628.8 linear feet of the south pier. Work under this contract is expected to begin early in July. The sum of $57.60 was expended during the year on this contract for engineering contingencies.

Money statement.

July 1, 1906, balance unexpended		$97,007.38
Amount appropriated by river and harbor act approved March 2, 1907		75,000.00
		172,007.38
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$32,653.56	
For maintenance of improvement	10,566.39	
		43,219.95
July 1, 1907, balance unexpended		128,787.43
July 1, 1907, outstanding liabilities		40.00
July 1, 1907, balance available		128,747.43
July 1, 1907, amount covered by uncompleted contracts		31,599.63
Amount (estimated) required for completion of existing project		154,750.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$154,750.00	
For maintenance of improvement	31,550.00	
		186,300.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

March 2, 1867	$59,000	August 11, 1888	$45,000
July 11, 1870	10,000	September 19, 1890	50,000
March 3, 1871	15,000	July 13, 1892	75,000
June 10, 1872	10,000	August 18, 1894	30,000
June 23, 1874	10,000	June 3, 1896	30,000
March 3, 1875	25,000	March 3, 1899	60,000
August 14, 1876	15,000	June 6, 1900 (allotments)	5,500
March 3, 1879	5,000	June 13, 1902	75,000
June 14, 1880	7,500	March 3, 1905	100,000
March 3, 1881	20,000	March 2, 1907	75,000
August 2, 1882	25,000	Miscellaneous receipts	110
July 5, 1884	20,000		
August 5, 1886	12,500	Total	779,610

CONTRACTS IN FORCE.

CONSTRUCTION AND REPAIR OF PIERS.

Contractor: Robert Love.
Date of contract: October 25, 1905.
Date of approval: November 6, 1905.
Date of beginning: May 1, 1906.
Date of expiration: December 1, 1906. (Time limit waived.)
Rates: Removing about 328 linear feet of crib work in north pier and restoring the cribs in their new position, lump sum of $6,500; dredging for crib foundations, 20 cents per cubic yard; foundation piles, 50 cents per linear foot; oak piles, 27 cents per linear foot; oak timber, $50 per thousand; pine or Douglas fir timber, $32.75 per thousand; pine or Douglas fir plank for sheet piles, $38.75 per thousand; pine or Douglas fir plank decking, $28.50 per thousand; drift bolts, screw bolts, carriage bolts, tie rods, and spikes, 3½ cents per pound; stone, $6.25 per cord; sand filling, 25 cents per cubic yard.

REPAIR OF SOUTH PIER.

Contractor: Nelson J. Gaylord.
Date of contract: April 17, 1907.
Date of approval: May 10, 1907.
Date of beginning: May 30, 1907.
Date of expiration: December 1, 1907.
Rates: Cutting down and removing old work, $2.75 per linear foot; oak piles, 40 cents per linear foot; oak timber, $50 per thousand; pine or Douglas fir timber, $42.50 per thousand; pine or Douglas fir plank for sheet piles, $50 per thousand; pine or Douglas fir plank for decking, $40 per thousand; drift bolts, screw bolts, tie rods, and spikes, 4 cents per pound; carriage bolts, 8 cents per pound; stone for riprap, $12 per cord; stone for filling, $7.50 per cord.

COAL FOR U. S. DREDGE "GILLESPIE."

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia Crown Hill, $3.10 per ton; Youghiogheny, $3.25 per ton; Hocking Valley, $2.95 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $2.85 per ton.

COMMERCIAL STATISTICS FOR MUSKEGON HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the collector of customs at Muskegon, Mich.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	671	571,045
Sail	236	27,989
Total	907	599,034

Maximum draft, 17 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Merchandise, miscellaneous	17,380	Merchandise, miscellaneous	19,087
Wheat	466	Coal	5,735
Corn	913	Plaster	150
Oats	279	Fruit	1,085
Barley	136	Iron	420
Lumber	32,676	Stucco	140
Pickets	6,111	Potatoes	15
Logs	437	Lumber	23,940
Stone	21,943	Slabs	1,125
Laths	638	Sawdust	145
Shingles	43	Wood	608
Coal	1,835		
Wood	1,005		
Flour	13		
Feed	15		
Total	83,890	Total	52,450

Total freight carried:	Tons.
1905	238,721
1906	136,340
Decrease	102,381

N N 8.

IMPROVEMENT OF HARBORS AT WHITE LAKE AND PENTWATER, MICHIGAN.

(A) WHITE LAKE HARBOR.

The dredging in progress at the beginning of the fiscal year under the contract with the Great Lakes Dredge and Dock Company was completed July 3, 1906, and resulted in a channel 14 feet deep and 90 feet wide between the piers, and 16 feet deep for the full width of the entrance through the outer bar. The quantity dredged in July was 844 cubic yards, the price per cubic yard was 17 cents, and the expenditure during the fiscal year on account of this contract was $2,524.95, including contingencies.

The available depths on June 8, 1907, were 11.8 feet outside on the line of the north pier, 12.8 to 13.5 feet in front of the entrance, and 13.1 feet on the line of the south pier, and between the piers 16 feet at the outer end and 13.7 feet on the shoalest cross section, shown by soundings on the above date. All the above depths refer to the level of zero of gauge.

Under date of April 3, 1907, a contract was entered into with Greiling Brothers for doing the required dredging at this harbor, at a price of 21½ cents per cubic yard. The sum of $46.27 was expended on this contract for contingencies.

(B) PENTWATER HARBOR.

Between July 10 and August 11, 1906, the harbor was dredged under the contract with the Great Lakes Dredge and Dock Company, with the result of restoring a channel 14 feet deep and 60 feet wide between the piers and 16 feet deep and 120 feet wide through the outer bar. The quantity dredged was 17,405 cubic yards, the price per cubic yard 17 cents, and the cost $3,140.63, including contingencies.

Soon after the completion of the above dredging the produced channel dimensions were found inadequate for the requirements of the steamer *Kansas*, which had begun making regular trips to Pentwater, and authority was obtained for deepening the channel to 16 feet with the U. S. dredge *Gillespie*. The latter was thereupon detached from the work commenced at Portage Lake, and between August 27 and September 18, 1906, the depth between the piers was increased to 16 feet and on the outer bar to 18 feet, the quantity dredged being 29,591 cubic yards, and the cost $4,109.84, including contingencies.

At the opening of navigation in the spring of 1907 the harbor was again in need of dredging, and the *Gillespie*, between April 24 and May 18, 1907, removed 30,139 cubic yards from the channel between the piers and through the outer bar, at a cost of $3,659.47, including contingencies.

The available depths, as found by soundings made June 11 to 12, 1907, were as follows: Outside, on line of north pier 17.7 feet, in

front of the entrance 15.8 to 16.5 feet, and on line of south pier 12.3 feet; between the piers, at the outer end 15.2 feet, near shore line 14.8 feet, and in the interior reach 15.2 feet. The depths given above refer to the level of zero of gauge.

Money statements.

WHITE LAKE HARBOR.

July 1, 1906, balance unexpended		$6,956.07
Refundment of overpayment		1.30
Amount appropriated by river and harbor act approved March 2, 1907		10,000.00
		16,957.37
June 30, 1907, amount expended during fiscal year, for maintenance of improvement		2,571.22
July 1, 1907, balance unexpended		14,386.15
July 1, 1907, outstanding liabilities		25.00
July 1, 1907, balance available		14,361.15
July 1, 1907, amount covered by uncompleted contracts		3,000.00
Amount (estimated) required for completion of existing project		21,720.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$21,720.00	
For maintenance of improvement	40,850.00	
		62,570.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

PENTWATER HARBOR.

July 1, 1906, balance unexpended		$12,265.90
Amount appropriated by river and harbor act approved March 2, 1907		10,000.00
		22,265.90
June 30, 1907, amount expended during fiscal year, for maintenance of improvement		10,909.94
July 1, 1907, balance unexpended		11,355.96
July 1, 1907, outstanding liabilities		20.00
July 1, 1907, balance available		11,335.96
Amount (estimated) required for completion of existing project		26,400.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$26,400.00	
For maintenance of improvement	14,400.00	
		40,800.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

Date.	Pentwater.	White Lake.	Total.
March 2, 1867	$55,000	$57,000.00	$112,000.00
April 10, 1869 (allotment)	17,820	44,550.00	62,370.00
July 11, 1870	10,000	20,000.00	30,000.00
March 3, 1871	10,000	20,000.00	30,000.00
June 10, 1872	30,000	10,000.00	40,000.00
March 3, 1873	20,000	7,000.00	27,000.00
June 23, 1874	.....	10,000.00	10,000.00
March 3, 1875	.....	10,000.00	10,000.00
August 14, 1876	10,000	5,000.00	15,000.00
June 18, 1878	10,000	12,000.00	22,000.00
March 3, 1879	6,000	7,500.00	13,500.00
June 14, 1880	4,000	5,000.00	9,000.00
March 3, 1881	10,000	7,500.00	17,500.00
August 2, 1882	10,000	12,000.00	22,000.00
July 5, 1884	15,000	10,000.00	25,000.00
August 5, 1886	10,000	10,000.00	20,000.00
August 11, 1888	8,000	10,000.00	18,000.00
September 19, 1890	8,000	17,000.00	25,000.00
July 13, 1892	5,000	5,000.00	10,000.00
August 18, 1894	5,000	5,000.00	10,000.00
June 3, 1896	5,000	5,000.00	10,000.00
March 3, 1899	25,000	35,000.00	60,000.00
June 13, 1902	20,000	15,000.00	35,000.00
March 3, 1905	12,000	8,000.00	20,000.00
March 2, 1907	10,000	10,000.00	20,000.00
Miscellaneous receipts	.....	1.30	1.30
Total	315,820	357,551.30	673,371.30

CONTRACTS IN FORCE.

DREDGING HARBORS AT PENTWATER AND WHITE LAKE, MICH.

Contractor: Great Lakes Dredge and Dock Company.
Date of contract: March 21, 1906.
Date of approval: April 2, 1906.
Date of beginning: April 20, 1906.
Date of expiration: October 5, 1906. (Time limit waived.)
Work: Dredging for maintenance of channel, at 17 cents per cubic yard.

DREDGING HARBOR AT WHITE LAKE, MICH.

Contractor: Greiling Brothers.
Date of contract: April 3, 1907.
Date of approval: April 15, 1907.
Date of beginning: May 2, 1907.
Date of expiration: October 2, 1907.
Work: Dredging for maintenance of channel, at 21½ cents per cubic yard.

COMMERCIAL STATISTICS FOR WHITE LAKE HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from a statement furnished by the Goodrich Transit Company at Chicago, Ill.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	78	87,388

Maximum draft, 13.1 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Merchandise, miscellaneous	250	Merchandise, miscellaneous	150

	Tons.
Total freight carried in 1906	400

COMMERCIAL STATISTICS FOR PENTWATER HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the village president at Pentwater, Mich.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	2,080	375,528
Sail	184	9,868
Total	2,264	385,396

Maximum draft, 14.8 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Coal	1,200	Potatoes	600
Seed peas	575	Peaches	375
Merchandise, miscellaneous	200	Lumber	263
Canned goods	200	Canned goods	10,000
Total	2,175	Total	11,238

Total freight carried:	Tons.
1906	13,413
1905	2,840
Increase	10,573

N N 9.

IMPROVEMENT OF LUDINGTON HARBOR, MICHIGAN.

Under a contract with Nelson J. Gaylord, dated July 16, 1906, the old revetment extending south from the inner end of the south pier along the shore of Pere Marquette Lake was repaired with additional piles and brush and stone, and extended to the southern boundary of the United States property by a wall of close piles backed with brush and stone. The work was begun November 7, 1906, and completed May 25, 1907, and its cost was $1,321.45, including contingencies.

Some minor repairs were made by day labor and purchased material to the timber work and decking of the two piers, at a cost of $654.22, including contingencies.

Under special agreements with Nelson J. Gaylord about 70 linear feet of the pile work in the south pier just east of the cribwork was strengthened with 9 piles driven along the rear wall and secured to the same with screw bolts, 70 cords stone were placed in the work to restore the filling, and some other damaged portions of the piers were repaired. The cost of these repairs was $1,112.21, including contingencies.

Soundings made April 23 to 26, 1907, showed the following available depths referred to the level of zero of gauge: Outside, on line of north pier 19.9 feet, in front of the entrance 20.7 to 22.5 feet, and on line of south pier 21.8 feet; between the piers the least depth in center of channel was 19.6 feet, and there was 18 feet for a width of 100 feet throughout.

The act approved March 2, 1907, appropriated $100,000 for improving this harbor in accordance with the report submitted in House Document No. 62, Fifty-ninth Congress, first session, and provided that the Secretary of War may enter into a contract or contracts for such material and work as may be necessary to complete said improvement according to the plan proposed in said House document, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate $739,087, exclusive of the amounts herein and heretofore appropriated.

The sum of $730.66 was expended during the year on account of U. S. dredge *Gillespie* for repairs while in dry dock, expenses while in winter quarters, and for this spring's survey.

The sum of $159. 57 was expended for engineering contingencies in connection with construction of breakwater under new project.

Money statement.

July 1, 1906, balance unexpended		$49,385.34
Amount appropriated by river and harbor act approved March 2, 1907		100,000.00
		149,385.34
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$159.57	
For maintenance of improvement	3,818.54	
		3,978.11
July 1, 1907, balance unexpended		145,407.23
July 1, 1907, outstanding liabilities		37.00
July 1, 1907, balance available		145,370.23
Amount (estimated) required for completion of existing project		739,087.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$739,087.00	
For maintenance of improvement	9,000.00	
		748,087.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

March 2, 1867	$50,000.00	August 11, 1888	$60,000.00
April 10, 1869 (allotment)	31,185.00	July 13, 1892	5,000.00
July 11, 1870	10,000.00	August 18, 1894	6,000.00
March 3, 1871	10,000.00	June 3, 1896	25,000.00
June 10, 1872	10,000.00	March 3, 1899	25,000.00
March 3, 1873	25,000.00	June 13, 1902	75,000.00
June 23, 1874	20,000.00	March 3, 1903	165,000.00
March 3, 1875	10,000.00	March 3, 1905	10,000.00
August 14, 1876	10,000.00	March 2, 1907	100,000.00
June 18, 1878	15,000.00	Miscellaneous receipts	.42
March 3, 1879	5,000.00		
June 14, 1880	8,000.00	Total	763,435.42
March 3, 1881	10,000.00	Amount carried to surplus fund, 1872	.90
August 3, 1882	12,000.00		
July 5, 1884	10,000.00		
August 5, 1886	56,250.00	Balance	763,434.52

CONTRACTS IN FORCE.

EMERGENCY CONTRACT FOR REPAIR OF SOUTH PIER.

Contractor: Nelson J. Gaylord.
Date of contract: July 16, 1906.
Date of beginning: Indefinite.
Date of expiration: November 30, 1906. (Time limit waived.)
Work: Oak piles, 35 cents per linear foot; brush, $5.50 per cord; stone, $9 per cord.

COAL FOR U. S. DREDGE "GILLESPIE."

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia Crown Hill, $3.45 per ton; Youghiogheny, $3.45 per ton; Hocking Valley, $3.20 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $3.05 per ton.

COMMERCIAL STATISTICS FOR LUDINGTON HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the collector of customs at Ludington, Mich.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	2,950	4,397,990
Sail	173	26,171
Total	3,123	4,424,161

Maximum draft, 19.6 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Lumber	244,137	Coal	454,463
Grain	146,651	Lumber	57,123
Flour	38,206	Salt	102,547
Beer	11,511	Iron	38,660
Malt	32,771	Cement	16,481
Corn	23,633	Bark	1,717
Copper	2,246	Wood	13,263
Bran	3,880	Potatoes	4,095
Cement	105	Sugar	2,500
Oil	60	Plaster	1,421
Coal	19,228	Brick	1,036
Feed	3,517	Stone	517
Middlings	236	Grain	550
Iron	5,309	Shingles	138
Hay	2,001	Woodware	10
Stone	2,381	Fruit	92
Apples	35	Vinegar	33
Merchandise, miscellaneous	126,263	Oil	92
		Flour	30
		Soda ash	333
		Merchandise, miscellaneous	140,213
Total	662,160	Total	835,264

NOTE.—There are three transportation lines which clear at Manistee and other northern ports doing a large passenger and freight business, but no credit is given for receipts and shipments at Ludington, as they only touch this port.

Total freight carried:	Tons.
1906	1,497,424
1905	1,421,558
Increase	75,866

N N 10.

IMPROVEMENT OF MANISTEE HARBOR, MICHIGAN.

The dredging by the U. S. dredge *Gillespie*, in progress at the beginning of the fiscal year, was completed July 3, and resulted in deepening the outer approach to the entrance to 20 feet, and the channel between the piers to 18 feet. The quantity dredged in July was 6,447 cubic yards. The amount expended during the year for this work and for dredging done in June, 1906, including contingencies, was $4,877.21.

On September 6, 1906, the Great Lakes Dredge and Dock Company, contractors, began the work of widening and deepening the channel

in the river from the bend to Manistee Lake, and completed it October 24, 1906. The quantity removed was 29,250 cubic yards, the price per cubic yard 17 cents, and the expenditure on account of this contract, including contingencies, was $5,297,32.

In April, 1907, a large stone was discovered on the north edge of the dredged channel in the river about 2,600 feet above the inner end of the north pier, was removed by a tug hired for the purpose and a diver, and deposited back of the south pier near its outer end. The cost of this operation was $76.33.

Soundings made June 20 to 24, 1907, showed the following available depths: Outside, on the line of the north pier, 18.5 feet; 70 feet south of that line, 16.9 feet; 130 feet south, 20.2 feet, and on the line of the south pier, 19.1 feet; in the channel between the piers, 20 feet at the outer end and 17 feet inside; in the river, 16 feet for a width of 20 feet, but 15 feet for a width of 80 feet. The depths refer to the level of zero of gauge.

During the month of October various parts of the front wall of the north pier, aggregating 130 linear feet, and the decking of both piers, were repaired with day labor and purchased material, at a cost of $524.86, including contingencies.

On December 12, 1906, the steam barge *John Schroder*, owned by Gus. Kitzinger, of Manistee, ran into the outer end of the north pier, carrying away the north side wall for a length of 12.5 feet and the outer cross wall for a length of 21 feet to a depth of 21 feet below top of pier. Since then the damage has been considerably increased by the winter storms. The sum of $20.59 was expended upon the examination of this damage.

Under date of April 3, 1907, a contract was entered into with Greiling Brothers for such dredging as may be required in the interior part of the channel, it being proposed to maintain the channel between the piers and in front of the entrance with the U. S. dredge *Gillespie*.

The amount of $83.52 was expended during the year on engineering contingencies on account of above contract.

Money statement.

July 1, 1906, balance unexpended	$22,572.45
Amount appropriated by river and harbor act approved March 2, 1907	25,000.00
	47,572.45
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	10,879.83
July 1, 1907, balance unexpended	36,692.62
July 1, 1907, amount covered by uncompleted contracts	5,000.00
Amount (estimated) required for completion of existing project	122,488.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	17,500.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

57	$60,000.00	August 5, 1886	$10,000.00
0	20,000.00	August 11, 1888	10,000.00
871	9,000.00	September 19, 1890	50,000.00
872	10,000.00	July 13, 1892	50,000.00
1873	10,000.00	August 18, 1894	12,000.00
1874	25,000.00	June 3, 1896	15,000.00
1875	14,000.00	March 3, 1899	20,000.00
4, 1876	15,000.00	June 13, 1902	42,000.00
, 1878	10,000.00	March 3, 1905	10,000.00
3, 1879	10,000.00	March 2, 1907	25,000.00
4, 1880	10,000.00	Miscellaneous receipts	24.87
3, 1881	15,000.00	Total	472,024.87
t 22, 1882	10,000.00		
5, 1884			

CONTRACTS IN FORCE.

DREDGING.

Contractor: Great Lakes Dredge and Dock Company.
Date of contract: March 21, 1906.
Date of approval: April 2, 1906.
Date of beginning: April 20, 1906.
Date of expiration: October 5, 1906. (Time limit waived.)
Work: Dredging for maintenance of channel, at 17 cents per cubic yard.

Contractor: Greiling Brothers.
Date of contract: April 3, 1907.
Date of approval: April 15, 1907.
Date of beginning: May 2, 1907.
Date of expiration: October 2, 1907.
Work: Dredging for maintenance of channel, at 21½ cents per cubic yar

COAL FOR U. S. DREDGE "GILLESPIE."

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia Crown Hill, $3.45 per ton; Youghiogheny, $3.
Hocking Valley, $3.20 per ton; Saginaw, $3 per ton; Pittsburg N
per ton.

COMMERCIAL STATISTICS FOR MANISTEE HARBOR, MICHIGAN.

YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the collector of customs at M

Vessels entered and cleared.

Character.	

APPROPRIATIONS.

March 2, 1867	$60,000.00	August 5, 1886	$10,000.00
July 11, 1870	20,000.00	August 11, 1888	10,000.00
March 3, 1871	9,000.00	September 19, 1890	50,000.00
June 10, 1872	10,000.00	July 13, 1892	50,000.00
March 3, 1873	10,000.00	August 18, 1894	12,000.00
June 23, 1874	10,000.00	June 3, 1896	15,000.00
March 3, 1875	25,000.00	March 3, 1899	20,000.00
August 14, 1876	14,000.00	June 13, 1902	42,000.00
June 18, 1878	15,000.00	March 3, 1905	10,000.00
March 3, 1879	10,000.00	March 2, 1907	25,000.00
June 14, 1880	10,000.00	Miscellaneous receipts	24.87
March 3, 1881	10,000.00		
August 22, 1882	15,000.00	Total	472,024.87
July 5, 1884	10,000.00		

CONTRACTS IN FORCE.

DREDGING.

Contractor: Great Lakes Dredge and Dock Company.
Date of contract: March 21, 1906.
Date of approval: April 2, 1906.
Date of beginning: April 20, 1906.
Date of expiration: October 5, 1906. (Time limit waived.)
Work: Dredging for maintenance of channel, at 17 cents per cubic yard.

Contractor: Greiling Brothers.
Date of contract: April 3, 1907.
Date of approval: April 15, 1907.
Date of beginning: May 2, 1907.
Date of expiration: October 2, 1907.
Work: Dredging for maintenance of channel, at 21½ cents per cubic yard.

COAL FOR U. S. DREDGE "GILLESPIE."

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia Crown Hill, $3.45 per ton; Youghiogheny, $3.45 per ton; Hocking Valley, $3.20 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $3.05 per ton.

COMMERCIAL STATISTICS FOR MANISTEE HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the collector of customs at Manistee, Mich.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	1,750	894,064
Sail	402	73,694
Total	2,152	967,758

Maximum draft, 16 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Merchandise, miscellaneous	17.149	Merchandise, miscellaneous	10,049
Stone	19,195	Salt	223,967
		Lumber	161,575
		Bark	9,485
		Shingles	456
		Wood	2,055
Total	36,344	Total	407,587

Total freight carried:	Tons.
1905	469,870
1906	443,931
Decrease	25,939

N N 11.

HARBOR OF REFUGE AT PORTAGE LAKE, MANISTEE COUNTY, MICHIGAN.

The only work done during the fiscal year was the dredging of the channel between the piers and through the outer bar on August 23 and between October 24 and November 1, 1906, restoring an available depth of 17 feet, where before there had been 15 feet. The quantity removed on the two occasions was 16,831 cubic yards, and the expenditures on account of this work were $2,010.33, including contingencies.

Soundings made June 27 to 28, 1907, showed the following available depths: On the outer approach to the entrance on the line of the north pier 19.1 feet, opposite the middle of the entrance 17.9 feet, and on the line of the south pier 22.2 feet; between the piers, at the outer end 19.6 feet for full width of channel, near shore line 17.4 feet in the middle and 16 feet for width of 120 feet, at the inner end 19 feet, with a depth of 18 feet for a width of 100 feet.

Money statement.

July 1, 1906, balance unexpended		$4,938.62
Amount appropriated by river and harbor act approved March 2, 1907		10,000.00
		14,938.62
June 30, 1907, amount expended during fiscal year, for maintenance of improvement		2,010.33
July 1, 1907, balance unexpended		12,928.29
July 1, 1907, outstanding liabilities		50.00
July 1, 1907, balance available		12,878.29
Amount (estimated) required for completion of existing project		15,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$15,000.00	
For maintenance of improvement	5,000.00	
		20,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

March 3, 1879	$10,000.00	August 18, 1894	$25,000.00
June 14, 1880	10,000.00	June 3, 1896	25,000.00
March 3, 1881	10,000.00	March 3, 1899	75,000.00
August 2, 1882	25,000.00	June 6, 1900	85,000.00
July 5, 1884	12,500.00	June 13, 1902	59,000.00
August 5, 1886	15,000.00	March 2, 1907	10,000.00
August 11, 1888	10,000.00		
September 19, 1890	8,000.00	Total	379,500.00

N N 12.

IMPROVEMENT OF HARBOR AT ARCADIA, MICHIGAN.

The Great Lakes Dredge and Dock Company, under its contract of March 21, 1906, began the work of restoring the proposed depth of 12 feet on August 16, and completed the same on September 4, 1906. The width of the dredged channel was 60 feet, and the quantity removed was 8,237 yards, the price per cubic yard being 17 cents, and the cost $1,544.13, including contingencies.

Under date of April 3, 1907, a contract was entered into with Greiling Brothers for such dredging as may be required during the season of 1907 for the restoration of a 12-foot channel depth. The price per cubic yard will be 21½ cents. The amount of $5.76 was expended during the year for engineering contingencies on this contract.

Soundings made July 1 to 3, 1907, showed the following available depths: In the outer approach, 8.5 feet on the line of the north pier, 9.3 feet in the center, and 10.9 feet on the line of the south pier; between the piers, 5.5 feet in the center, but 8 feet close to the outer 500 feet of the north pier and thence in the center of the channel.

Money statement.

July 1, 1906, balance unexpended	$2,804.41
Amount appropriated by river and harbor act approved March 2, 1907	6,000.00
	8,804.41
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,549.89
July 1, 1907, balance unexpended	7,254.52
July 1, 1907, amount covered by uncompleted contracts	2,500.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907:	
One year	3,000.00
Two years	6,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	

APPROPRIATIONS.

March 3, 1905	$6,000
March 2, 1907	6,000
Total	12,000

CONTRACTS IN FORCE.

DREDGING.

Contractor: Great Lakes Dredge and Dock Company.
Date of contract: March 21, 1906.
Date of approval: April 2, 1906.
Date of beginning: April 20, 1906.
Date of expiration: October 5, 1906. (Time limit waived.)
Work: Dredging for maintenance of channel, at 17 cents per cubic yard.
Contractor: Greiling Brothers.
Date of contract: April 3, 1907.
Date of approval: April 15, 1907.
Date of beginning: May 2, 1907.
Date of expiration: October 2, 1907.
Work: Dredging for maintenance of channel, at 21½ cents per cubic yard.

COMMERCIAL STATISTICS FOR ARCADIA HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by navigation interests of Arcadia, and vicinity, Michigan.]

Vessels entered and cleared.

Number	945
Tonnage	80,278
Maximum draft ... feet	8

Receipts and shipments by vessel, 1906.

	Tons.
Hay	500
Apples	200
Peaches	100
Berries	125
Cherries	5
Potatoes	1,050
Dressed meats	34
Total	2,014

Millions of feet of forest products.

N N 13.

IMPROVEMENT OF FRANKFORT HARBOR, MICHIGAN.

Between November 20 and December 5, 1906, the channel at the entrance and through the outer bar was deepened by the U. S. dredge *Gillespie* to 21.8 feet, the depth before dredging having been 17 feet. The quantity removed was 20,831 cubic yards, and the cost was $3,075.04, including contingencies.

Between August 23 and September 4, 1906, the following repairs were made with day labor and purchased material: The cross wall at the injured outer end of the south pier was strengthened with 6 screw bolts, restoring its connection with the side walls. A number of damaged places in the two piers, aggregating 121 linear feet in the north pier and 73 linear feet in the south pier, and the decking on both piers, were repaired, and about 150 loose screw bolts and tie rods were tightened up. The cost of these repairs was $602.68, including contingencies.

The following cases of damage to the piers were reported during the fiscal year: On October 18, 1906, the steamer *Illinois*, of the Northern Michigan Transportation Company, while entering the harbor, struck the front wall of the south pier near the fog signal, slightly damaging the upper timbers.

On November 19, 1906, the south pier between stations 14 and 15 was struck by the steamers *Ann Arbor No. 1* and *Ann Arbor No. 2*, and several superstructure timbers were broken. Some injury was also done to the north pier by the *Ann Arbor No. 1*.

On January 10, 1907, the *Ann Arbor No. 1*, while trying to enter the harbor, struck the outer end of the north pier, doing considerable damage to the pier.

On February 14, 1907, the *Ann Arbor No. 2*, entering the harbor during a NNW. gale, ran into the outer end of the south pier and destroyed from 10 to 30 feet more of that pier.

Soundings made July 5 to 6, 1907, showed an available depth of 20.3 feet outside of the entrance and 19.4 feet between the piers. The depths refer to the level of zero gauge.

Money statement.

July 1, 1906, balance unexpended		$24,442.55
Amount appropriated by river and harbor act approved March 2, 1907		20,000.00
		44,442.55
June 30, 1907, amount expended during fiscal year, for maintenance of improvement		3,677.72
July 1, 1907, balance unexpended		40,764.83
Amount (estimated) required for completion of existing project		13,200.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$13,200.00	
For maintenance of improvement	15,000.00	
		28,200.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

Aux Becs Scies, Michigan:	
June 23, 1866	$88,541.00
March 2, 1867	10,000.00
July 25, 1868 (allotment)	10,000.00
April 10, 1869 (allotment)	29,318.85
July 11, 1870	10,000.00
March 3, 1871	10,000.00
Frankfort, Michigan:	
June 10, 1872	10,000.00
March 3, 1873	10,000.00
June 23, 1874	10,000.00
March 3, 1875	10,000.00
August 14, 1876	3,000.00
June 18, 1878	8,800.00
March 3, 1879	4,000.00
June 14, 1880	5,000.00
March 3, 1881	10,000.00
August 2, 1882	15,000.00
Frankfort, Mich.—Cont'd.	
July 5, 1884	$5,000.00
August 5, 1886	7,000.00
August 11, 1888	8,000.00
September 19, 1890	10,000.00
July 13, 1892	10,000.00
August 18, 1894	50,000.00
June 3, 1896	15,000.00
March 3, 1899	35,000.00
June 13, 1902	54,500.00
March 3, 1905	20,000.00
March 2, 1907	20,000.00
Total	478,159.85
Amount covered into the Treasury (Report, 1871, p. 133)	5,721.50
Balance	472,438.35

CONTRACT IN FORCE.

COAL FOR U. S. DREDGE "GILLESPIE."

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia Crown Hill, $3.45 per ton; Youghiogheny, $3.45 per ton; Hocking Valley, $3.20 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $3.05 per ton.

COMMERCIAL STATISTICS FOR FRANKFORT HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the deputy collector of customs at Frankfort, Mich.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	1,506	1,483,266
Sail	127	9,823
Total	1,633	1,493,089

Maximum draft, 19.4 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Freight cars:		Freight cars:	
Loaded	118,090	Loaded	316,995
Empty	1,695	Empty	735
Barley	32,242	Coal	44,306
Oats	14,294	Merchandise, miscellaneous	28,676
Rye	8,691	Iron	5,650
Wheat	120	Salt	335
Malt	3,979	Stone	30
Copper	6,975	Cement	333
Iron	2,380	Furniture	21
Flour	3,727	Bark	153
Feed and bran	175	Brick	75
Merchandise, miscellaneous	63,934	Cabbage and potatoes	3
Vegetables	82	Lumber	16,744
Lumber	42,525	Wood	1,245
Hay	42	Slabs	4,184
Stone	259	Sawdust	455
Shingles	14	Shingles	11
Corn	28	Lath	15
		Apples	91
Total	299,252	Total	420,007

Total freight carried:	Tons.
1905	838,205
1906	719,259
Decrease	118,946

N N 14.

IMPROVEMENT OF CHARLEVOIX HARBOR, MICHIGAN.

The U. S. dredge *Gillespie*, between August 9 and 20, 1906, restored a depth of 17 feet in the upper channel, 18 feet in the lower channel, and 19 feet on the outer bar. The dredged quantity was 21,291 cubic yards, and the *cost $2,506.64, including* contingencies.

The operations by Nelson J. Gaylord under his contract of September 28, 1905, for repairing 600 linear feet of the north pier of the lower channel and 321 feet of the south revetment of the upper channel and for refilling the north revetment of the upper channel, which were begun June 12, 1906, were continued, and the timberwork was practically completed October 31, 1906. As the contractor found it impossible to obtain the remainder of the stone required for the completion of his contract before the close of navigation, operations were suspended at that time and resumed June 5, 1907.

The repairs of the north pier of the lower channel consisted in driving a new row of front piles, 2 feet between centers, and a new row of rear piles, 8 feet between centers, secured by wales and screw bolts and tie-rods, building a superstructure four courses high on top, and filling the work with stone. The stone filling as yet remains incomplete. The repairs of the south revetment of the upper channel consisted in driving additional piles in both side walls to restore their efficiency, building a new superstructure 4 feet high in the front wall and 3 feet high in the rear wall, and in refilling the work with stone to the level of +1 foot. This part of the contract, as also that of refilling the north revetment of the upper channel, has been completed. The expenditures during the year on account of this contract were $12,521.15, including contingencies.

Under a special agreement with Nelson J. Gaylord the outer end pockets of both piers were refilled with 13 cords stone, the broken-down west end of the stone portion of the north pier was rebuilt with 10.31 cords stone, and a number of loose screw bolts and tie-rods in the south pier were tightened up. The cost of this work has been $444.82, including contingencies.

Soundings made July 9 to 11 showed the following available depths, referring to the level of zero of gauge: In the lower channel 19.8 to 20.4 feet opposite the entrance, with 18.4 feet on the line of the north pier and 16.3 feet on the line of the south pier, and 16.7 feet on the shoalest section between the piers; in the upper channel 16.4 feet on the shoalest section.

Money statement.

July 1, 1906, balance unexpended		$22,211.06
Amount appropriated by river and harbor act approved March 2, 1907		20,000.00
		42,211.06
June 30, 1907, amount expended during fiscal year, for maintenance of improvement		[a] 15,762.27
July 1, 1907, balance unexpended		26,448.79
July 1, 1907, amount covered by uncompleted contracts		3,429.04
Amount (estimated) required for completion of existing project		23,750.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$23,750.00	
For maintenance of improvement	15,000.00	
		38,750.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

[a] Includes Treasury settlement, $289.66, chargeable to maintenance of U. S. *dredge Gillespie* previous to arrival in Grand Rapids district.

APPROPRIATIONS.

August 14, 1876	$10,000.00	July 13, 1892	$10,000.00
June 18, 1878	12,000.00	August 18, 1894	8,000.00
March 3, 1879	9,000.00	June 3, 1896	20,000.00
June 14, 1880	10,000.00	March 3, 1899	15,000.00
March 3, 1881	10,000.00	June 13, 1902	20,000.00
August 2, 1882	10,000.00	March 3, 1905	25,000.00
July 5, 1884	10,000.00	March 2, 1907	20,000.00
August 5, 1886	10,000.00	Miscellaneous receipts	119.65
August 11, 1888	12,500.00		
September 19, 1890	9,000.00	Total	220,619.65

CONTRACTS IN FORCE.

REPAIR OF PIER AND REVETMENTS.

Contractor: Nelson J. Gaylord.
Date of contract: September 28, 1905.
Date of approval: October 23, 1905.
Date of beginning: May 1, 1906.
Date of expiration: November 1, 1906. (Time limit waived.)
Rates: Cutting down and removing old work, 75 cents per linear foot; oak piles, 34 cents per linear foot; oak timber, $45 per M; white, Norway, or Southern pine, or Douglas fir timber, $34.50 per M; driftbolts, 3½ cents per pound; screw bolts and tie-rods, 4 cents per pound; stone, $6.85 per cord.

COAL FOR U. S. DREDGE "GILLESPIE."

Contractor: Century Fuel Company.
Date of contract: May 14, 1907.
Date of approval: June 15, 1907.
Date of beginning: June 15, 1907.
Date of expiration: December 31, 1907.
Rates: West Virginia, Crown Hill, $3.45 per ton; Youghiogheny, $3.45 per ton; Hocking Valley, $3.20 per ton; Saginaw, $3 per ton; Pittsburg No. 8, $3.05 per ton.

COMMERCIAL STATISTICS FOR CHARLEVOIX HARBOR, MICHIGAN, CALENDAR YEAR ENDING DECEMBER 31, 1906.

[Compiled from statement furnished by the deputy collector of customs at Charlevoix, Mich.]

Vessels entered and cleared.

Character.	Number.	Tonnage.
Steam	161	129,411
Sail	89	15,208
Total	250	144,619

Maximum draft, 16 feet.

Receipts and shipments by vessel, 1906.

Articles received.	Tons.	Articles shipped.	Tons.
Merchandise, miscellaneous	481	Merchandise, miscellaneous	386
Railroad spikes	3	Lumber	21,301
Wood	69	Slabs	7,645
Corn	784	Bark	513
Wheat	270	Posts	12
Oats	96		
Grain	247		
Feed	65		
Coal	2,510		
Stone	2,031		
Total	6,556	Total	29,857

Total freight carried:	Tons.
1905	66,670
1906	36,413
Decrease	30,257

N N 15.

IMPROVEMENT OF PETOSKEY HARBOR, MICHIGAN.

Operations under the contract with A. J. Beauvais & Co., dated July 2, 1903, for the extension of the breakwater were finally completed September 29, 1906, the work since July 1, 1906, having consisted in leveling up cribs 7 and 8, building the third and fourth courses of superstructure, placing the mooring posts, filling the work with stone, and putting on the decking. The extension of the breakwater under this contract amounted to 300.8 linear feet, and the expenditure on its account during the fiscal year was $6,589.35, including contingencies.

Burk, Smith & Nelson, under their contract of September 18, 1905, for the further extension of the breakwater by a crib 100 feet long, continued operations. The crib was sunk July 14, the four courses of superstructure were built, the work was filled with stone and decked over, and the west side and north end were protected by a riprap of heavy stone. The contract was completed October 13, and the expenditure on its account during the fiscal year was $13,075.75, including contingencies.

Under date of June 8, 1907, a contract was entered into with Burk, Smith & Nelson for the extension of the breakwater by one crib 100 feet long, and for repairing the stone section of the breakwater at its inshore end. Operations are to be commenced early in July, 1907.

Money statement.

July 1, 1906, balance unexpended		$24,177.66
Amount appropriated by river and harbor act approved March 2, 1907		17,500.00
		41,677.66
June 30, 1907, amount expended during fiscal year, for works of improvement		[a] 19,667.48
July 1, 1907, balance unexpended		22,010.18
July 1, 1907, amount covered by uncompleted contracts		18,606.53
Amount (estimated) required for completion of existing project		56,900.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$18,000.00	
For maintenance of improvement	2,000.00	
		20,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

September 19, 1890	$15,000	June 13, 1902	$15,000
July 13, 1892	20,000	March 3, 1905	20,000
August 18, 1894	10,000	March 2, 1907	17,500
June 3, 1896	8,000		
March 3, 1899	20,000	Total	125,500

CONTRACTS IN FORCE.

EXTENSION OF WEST BREAKWATER.

Contractors: A. J. Beauvais & Co.
Date of contract: July 2, 1903.
Date of approval: July 28, 1903.
Date of beginning: Any time prior to May 1, 1904.
Date of expiration: November 1, 1904 (time limit waived).
Rates: Removing north breakwater cribs and stone filling and replacing same in west breakwater, lump sum of $8,250; white oak timber, $60 per M; white pine, long-leaf yellow pine, or Douglas fir timber, $35 per M; white pine or long-leaf yellow-pine timber for deck, $34 per M;; hemlock or Norway-pine timber, $28.50 per M; driftbolts and screw bolts, 4 cents per pound; spikes, 5 cents per pound: stone, $6.50 per cord.

Contractors: Burk, Smith & Nelson.
Date of contract: September 18, 1905.
Date of approval: September 28, 1905.
Date of beginning: May 1, 1906.
Date of expiration: November 1, 1906.
Rates: White oak timber, $50 per M; white Norway or southern pine or Douglas fir timber, $36 per M; hemlock timber, $26 per M; driftbolts, screw bolts, and spikes, 4 cents per pound; stone, $7.95 per cord.

EXTENSION AND REPAIR OF BREAKWATER.

Contractors: [illegible] Nelson.
Date of [illegible] 9.14
Date of [illegible] 00.00
Date [illegible] 309.14
[illegible] 858.82
[illegible] 2,450.32
[illegible] 5,000.00

APPENDIX O O.

IMPROVEMENT OF CERTAIN RIVERS AND HARBORS ON THE EASTERN COAST OF MICHIGAN.

REPORT OF COL. CHAS. E. L. B. DAVIS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Cheboygan Harbor, Michigan.
2. Alpena Harbor (Thunder Bay River), Michigan.
3. Saginaw River, Michigan.
4. Sebewaing River, Michigan.
5. Harbor of refuge at Harbor Beach, Lake Huron, Michigan.
6. Mouth of Black River, Rouge River, and Monroe Harbor, Michigan.
7. Black River at Port Huron, Michigan.
8. Pine River, Michigan.
9. Belle River, Michigan.
10. Clinton River, Michigan.

(For letter of transmittal, see Appendix P P.)

O O 1.

IMPROVEMENT OF CHEBOYGAN HARBOR, MICHIGAN.

Borings, in order to determine the nature of the underlying material in the stretch between the bridge and lock, were made during the month of May, and specifications covering the proposed work drawn up.

A survey of this harbor, completed on June 16, 1906, shows the improved channel to be in good condition throughout, a depth of 17 feet being available from the Straits of Mackinac to Baker's steamboat landing, the least depth between that place and the State Road Bridge being 10 feet.

Money statement.

July 1, 1906, balance unexpended	$8,309.14
Amount appropriated by river and harbor act approved March 2, 1907	15,000.00
	23,309.14
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	858.82
July 1, 1907, balance unexpended	22,450.32
Amount (estimated) required for completion of existing project	5,000.00

APPROPRIATIONS.

March 3, 1871	$10,000	July 5, 1884	$5,000
June 10, 1872	15,000	August 5, 1886	15,000
March 3, 1873	15,000	August 11, 1888	15,000
June 23, 1874	15,000	June 3, 1896	12,000
March 3, 1875	15,000	March 3, 1899	8,000
August 14, 1876	10,000	June 13, 1902	8,000
June 18, 1878	8,000	March 3, 1905	7,500
March 3, 1879	3,000	March 2, 1907	15,000
June 14, 1880	6,000		
March 3, 1881	6,000	Total	198,500
August 2, 1882	10,000		

COMMERCIAL STATISTICS.

Receipts and shipments by vessel for the calendar year ended December 31, 1906.

[Compiled from statements furnished by the deputy collector of customs, Cheboygan, Mich.]

Articles.	Received.	Shipped.	Articles.	Received.	Shipped.
	Tons.	*Tons.*		*Tons.*	*Tons.*
Bricks		11	Salt		1
Cedar posts		4,592	Stone	1,200	
Coal	4,766	800	Tan bark		20
Fish		300	Telegraph poles		31,250
Fruit, miscellaneous	75	10	Oats	5	35
Grain		7	Wood	53	1,542
Hay and feed		22	Oil	20	
Lath		225	Ties		4,790
Lime and cement	220	3	Gasoline		15
Logs	304,500		Blocks		5
Lumber	4,531	89,800	Staves		1,250
Machinery	18		Sugar		600
Merchandise, general	3,014	3,308			
Paper		2,500	Total	318,442	141,086

O O 2.

IMPROVEMENT OF ALPENA HARBOR (THUNDER BAY RIVER), MICHIGAN.

The river and harbor act approved March 2, 1907, appropriated $4,000 for maintenance, and it is proposed to expend this amount in removing shoals so as to secure a navigable depth of 16 feet in the bay and river in accordance with project.

Advertisement invinting bids for the hire of a dredging plant for this purpose was published June 3, 1907, bids to be opened July 3, 1907, and it is expected that the work will be completed during the coming summer.

Original estimate of cost, 1876, 1881, and 1889 (aggregate)	$55,851.48
Whole amount expended to June 30, 1907	50,062.60

Money statement.

July 1, 1906, balance unexpended	$1,467.31
Amount appropriated by river and harbor act approved March 2, 1907	4,000.00
	5,467.31
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	29.91
July 1, 1907, balance unexpended	5,437.40
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	4,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

Thunder Bay Harbor, Michigan:	
August 14, 1876	$4,500
August 2, 1882	15,000
September 19, 1890	5,500
Thunder Bay River, Michigan:	
September 19, 1890	10,000
July 13, 1892	10,000
Alpena Harbor, Michigan:	
August 18, 1894	$4,000
June 3, 1896	2,500
March 2, 1907	4,000
Total	55,500

COMMERCIAL STATISTICS.

Receipts and shipments by vessel for the calendar year ended December 31, 1906.

[Compiled from statements furnished by Mr. Jos. S. Moffat, deputy collector of customs, Alpena, Mich.]

Articles.	Received.	Shipped.	Articles.	Received.	Shipped.
	Tons.	*Tons.*		*Tons.*	*Tons.*
Brick		1,000	Leather		2
Cedar posts		14,739	Lime and cement		31,545
Cedar ties		31,183	Lumber		86,233
Coal	44,092		Machinery	1,200	150
Farm products	270		Merchandise	16,100	4,000
Fish	1,081	200	Paper	5	250
Flour	1,092		Salt	1,148	
Fruit, miscellaneous	345		Shingles		1,238
Grain	907				
Hay and feed	11,000	100	Total	78,241	171,185
Laths		1,545			

O O 3.

IMPROVEMENT OF SAGINAW RIVER, MICHIGAN.

The present approved project for this river, calling for a channel 200 feet wide and 14 feet deep from deep water in Saginaw Bay to Bay City, and thence 12 feet deep to the upper limits of Saginaw City, has not been completed, the work done thus far having secured only a narow through channel of the required depth. This channel has little permanence, bars usually forming after each spring freshet.

The operations conducted during the past fiscal year have related to the maintenance of the channel.

The dredging operations which were in progress at the beginning of the present fiscal year under contract with James Davidson, of West Bay City, Mich., dated September 28, 1905, at 25 cents per cubic yard, scow measurement, were continued until September 17, 1906, when the work was stopped.

Work on the shoal at Crow Island was completed on July 21, after which a 12-foot channel was dredged in succession through the four shoals existing at Melbourne, below Willow Island, below N. Y. Works, and at the head of the Carrollton channel.

Eighty-three thousand four hundred and twenty-two cubic yards of material were removed under this contract with James Davidson, and a 14-foot channel was provided from Saginaw Bay to Bay City and a 12-foot channel from Bay City to the head of Carrollton channel, leaving shoals still existing between this point and the city of Saginaw, with not more than 10 feet of water over them.

The river and harbor act approved March 2, 1907, appropriated $75,000 for the improvement of this river. This with the $31,000 remaining on hand from previous appropriations made $106,000 available for the work. It is proposed to expend this amount in dredging the river and repairing and constructing works of contraction in order to secure the depths and widths called for by the approved project, first making a complete survey of the river, in order to formulate a definite plan of improvement.

Money statement.

July 1, 1906, balance unexpended	$46,635.89
Amount appropriated by river and harbor act approved March 2, 1907	75,000.00
	121,635.89
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	15,511.89
July 1, 1907, balance unexpended	106,124.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	50,000.00

APPROPRIATIONS.

June 23, 1866	$67,500.00	September 19, 1890	$75,000.00
March 2, 1867	28,000.00	July 13, 1892	100,000.00
July 25, 1868 (allotment)	9,000.00	August 18, 1894	40,000.00
July 11, 1870	1,500.00	June 3, 1896	40,000.00
June 23, 1874	15,000.00	March 3, 1899	40,000.00
March 3, 1875	30,000.00	June 13, 1902	50,000.00
August 14, 1876	11,000.00	Repayments	1.84
June 18, 1878	25,000.00	March 3, 1905	30,000.00
March 3, 1879	8,000.00	March 2, 1907	75,000.00
June 14, 1880	15,000.00		
March 3, 1881	10,000.00		943,751.84
August 2, 1882	125,000.00	Carried to surplus fund	1,000.00
July 5, 1884	50,000.00		
August 5, 1886	33,750.00	Balance	942,751.84
August 11, 1888	65,000.00		

Estimated cost of successive projects, 1867 to 1882	$289,795.00
Estimated cost of project for 1882	446,000.00
Total	735,795.00
Carried to surplus fund	1,000.00
Whole amount expended to June 30, 1907	836,627.84

CONTRACT IN FORCE.

Name of contractor: James Davidson, of West Bay City, Mich.
Character of work: Dredging.
Price: Twenty-five cents per cubic yard, scow measurement.
Date of approval: October 21, 1905.
Date of beginning work: September 1, 1905.
Date of completion: September 17, 1906.

COMMERCIAL STATISTICS.

Receipts and shipments by vessels for the calendar year ended December 31, 1906.

[Compiled from statements furnished by D. C. Brawn, deputy collector, Bay City, Mich., and W. G. Emerick, deputy collector, Saginaw, Mich.]

Articles.	Received.	Shipped.	Articles.	Received.	Shipped.
	Tons.	*Tons.*		*Tons.*	*Tons.*
Coal	15,923	.....	Machinery	1,140	.....
Fish	3	.....	Salt	.....	13,092
Flour	243	.....	Stone	9,557	.....
Lath	1,631	.....	Pickets	3,785	.....
Cement	.....	1,600	Square timber	.....	187
Logs	48,300	.....			
Lumber	193,663	3,981	Total	274,245	18,860

O O 4.

IMPROVEMENT OF SEBEWAING RIVER, MICHIGAN.

As a result of operations at this locality, a channel of the length 3 miles, and depth 8 feet, contemplated by the project, but with widths varying from 70 to 90 feet, has been secured.

A survey of this river, completed June 26, 1906, showed that the available depth of the entire improvement is not over 7 feet. Considerable shoaling has taken place at the mouth of the cut and about 2,200 feet beyond it. The outer channel is in good condition for a distance of about 1½ miles, beginning at the outer end. Toward the shore the channel has filled up with sand and mud to a depth of 1 to 2 feet in places, and the banks cast up on both sides of the cut farther inshore have caved in so as to greatly reduce the width of the dredged channel, which is now not more than 25 feet up to the boat landing.

An examination made in June, 1907, shows no appreciable change in the channel since the survey of June, 1906. No work was in progress during the past fiscal year and none is recommended for the present.

Money statement.

July 1, 1906, balance unexpended	$941.44
Amount appropriated by river and harbor act approved March 2, 1907	2,000.00
	2,941.44
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	197.30
July 1, 1907, balance unexpended	2,744.14

APPROPRIATIONS.

March 3, 1875	$8,000	March 3, 1905	$5,000
June 14, 1880	7,000	March 2, 1907	2,000
June 3, 1896	5,000		
March 3, 1899	32,000	Total	59,000

COMMERCIAL STATISTICS.

Receipts and shipments by vessels for the calendar year ended December 31, 1906.

[Compiled from statements furnished by Messrs. J. C. Liken & Co., of Sebewaing, Mich.]

Articles.	Received.	Shipped.	Articles.	Received.	Shipped.
	Tons.	*Tons.*		*Tons.*	*Tons.*
Brick		60	Hay and feed		100
Cedar posts	40		Lath	200	
Coal	200		Lime and cement	300	
Farm products, miscellaneous		1,500	Lumber	3,000	
Fish		20	Salt		120
Flour		175	Shingles	2,000	
Fruit, miscellaneous		100	Total	5,740	4,075
Grain		2,000			

O O 5.

IMPROVEMENT OF HARBOR OF REFUGE AT HARBOR BEACH, LAKE HURON, MICHIGAN.

At the beginning of the present fiscal year, operations were in progress under the two contracts with Messrs. Hugo & Tims, of Duluth Minn., approved August 28, 1903, and May 29, 1906, for rebuilding in concrete the superstructure of part of the main pier. Operations under the first contract were begun June 12, 1904, and under the second contract May 24, 1906. The work under the first contract was completed and accepted during the month of August, 1906, 1,706 linear feet of superstructure being built. The total payment to the contractors was $201,677.26.

Operations under the second contract were continued during the fiscal year, and satisfactory progress was made. The work began at station 1706, the point where work under the first contract was stopped, and is to be carried south along the main pier as far as the available $200,000 will carry it under the unit prices of the contract. At the close of the fiscal year the old timber superstructure had been torn out and retimbered to station 3180, footing blocks had been set to station 3168, and 43 monolithic blocks had been built in position, making 2,521 linear feet of completed superstructure.

On May 27, 1907, bids were received for rebuilding in concrete the superstructure of the remaining portion of the main pier under the appropriation of $150,000 made by the river and harbor act of March 2, 1907, and on June 10, 1907, contract was entered into with Hugo & Tims, the lowest bidders; contract approved June 26, 1907.

The superstructures of the piers in recent years have been repaired mainly with hemlock, which has so badly decayed that constant repairs are needed to keep the piers in proper condition.

During the months of July and August, 1906, a new decking of 3 by 10 inch plank was placed over the southerly 720 feet of the South Pier, and 6 by 6 inch stringers were laid for this distance, and the decayed planks in the rest of the pier were removed and replaced by new planks, placing the whole pier in good repair. How-

ever, the severe storms of the fall and winter made several holes in this pier, also carrying away the stone filling of the cribs. During the summer of 1906, repairs were also made to that portion of the main pier not under contract. The break through the sea wall near the light-house was repaired, and new decking was placed for a distance of 280 feet south of the south angle. The gale of October 27 washed down some of the sea wall of the main pier, which was promptly repaired.

The following revised extracts, compiled from the annual report of Assistant Engineer E. J. Duffies, give items of interest which have arisen in connection with the work during the year, in addition to those contained in last annual report:

Removing superstructure.—The operation of removing the superstructure, leveling off, and timbering, was carried on in the same manner as described in the last annual report. The surplus rock taken from the superstructure was deposited along the lake face of the main pier where soundings showed low spots, most of it being placed between block 3 and block 75. The rock filling between blocks 3 and 51 was gone over a second time in 1906, and has withstood the storms of the past winter very well. But between blocks 51 and 75 the filling has settled and will have to be gone over again to make it permanent. A very deep hole was found between blocks 99 and 103. This has been filled up, but past experience shows that the storms of the fall will settle this filling and it will have to be refilled in the spring.

Concrete blocks.—The deposit of sand and gravel obtained from the St. Clair River at Port Huron was used exclusively for making concrete. This aggregate is a natural mixture of sand and gravel, and numerous tests made to ascertain the percentages of sand and gravel it contains show that there is on an average about 34 per cent of sand and 66 per cent of gravel. The specific gravity of the sand is 2.73, while that of the gravel is 2.69. The grade of the sand has been tested by a large number of siftings during the season of 1906, with the following average results: Five per cent of the sand is retained on a No. 6 sieve; 12 per cent is retained on a No. 8 sieve; 16 per cent is retained on a No. 10 sieve; 53 per cent is retained on a No. 20 sieve; 84 per cent is retained on a No. 30 sieve; 90 per cent is retained on a No. 50 sieve, and 98 per cent is retained on a No. 80 sieve. It has a uniformity coefficient of about 5.2, and, as shown by the tests, is very well graded. The cement used in the work has stood all the tests required of it by the specifications. No extensive long-time tests have as yet been made of this cement, but there are some under way, and all that have been made so far show that it continues to increase in strength with age.

During the past season 752 concrete blocks were made in 94 working days; 5,277 cubic yards of aggregate and 4,588 barrels of cement were used to make the 4,530 cubic yards of concrete contained in these blocks. Fifty monolithic blocks were built in position, requiring 50 working days. These blocks contained 9,743 cubic yards of concrete. To make this amount of concrete there were used 10,894 cubic yards of aggregate and 9,668¼ barrels of cement.

The contract price of the new concrete superstructure under the first contract with Hugo & Tims per linear foot was $115.51; under the second contract $108.62 per linear foot, and under the third contract it will be $119.98 per linear foot.

The total amount expended during the fiscal year was $177,519.60, of which $2,364.30 was applied to making necessary repairs to the main pier, $5,660.16 to supervision of vessels using the harbor and control of the harbor, and $169,495.14 to building concrete superstructure and expenses in connection therewith.

Money statement.

July 1, 1906, balance unexpended	$290,781.62
Amount appropriated by river and harbor act approved March 2, 1907	150,000.00
	440,781.62
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	177,519.60
July 1, 1907, balance unexpended	263,262.02
July 1, 1907, outstanding liabilities	21,800.00
July 1, 1907, balance available	241,462.02
July 1, 1907, amount covered by uncompleted contracts	210,426.59
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	275,000.00

APPROPRIATIONS.

March 3, 1871	$100,000.00	June 3, 1896	$16,000.00
June 10, 1872	100,000.00	March 3, 1899	50,000.00
March 3, 1873	75,000.00	June 6, 1900	150,000.00
June 23, 1874	75,000.00	June 13, 1902	7,500.00
March 3, 1875	100,000.00	April 28, 1904	50,000.00
August 14, 1876	75,000.00	March 3, 1905	200,000.00
June 18, 1878	100,000.00	March 2, 1907	150,000.00
March 3, 1879	75,000.00		
June 14, 1880	75,000.00	Total	1,943,500.00
March 3, 1881	50,000.00	Carried to surplus fund	30,000.00
August 2, 1882	75,000.00		
July 5, 1884	75,000.00		1,913,500.00
August 5, 1886	75,000.00	Received from other sources	2,867.21
August 11, 1888	70,000.00		
September 19, 1890	30,000.00		
July 13, 1892	150,000.00	Total	1,916,367.21
August 18, 1894	20,000.00		

CONTRACTS IN FORCE.

Contract in force with Hugo & Tims, of Duluth, Minn., for rebuilding superstructure of main pier in concrete, approved August 28, 1903; date of beginning work, June 12, 1904; to be completed in 294 working days; contract cost per linear foot, $115.51; contract in force with Hugo & Tims for rebuilding in concrete the second section of the superstructure of the main pier, approved May 29, 1906; actual date of beginning work, May 24, 1906; to be completed in 310 working days; contract cost per linear foot, $108.62; also contract in force with Hugo & Tims for rebuilding the superstructure of the remaining portion of the main pier, approved June 26, 1907; to be completed in approximately 210 working days; contract cost per linear foot, $119.98.

COMMERCIAL STATISTICS.

TABLE No. 1.—*Summary of vessels sheltered in the harbor of refuge at Harbor Beach, Mich., from July 1, 1906, to June 30, 1907, and the direction of wind at time of entering the harbor.*

Direction of wind at time of entering.	1906.						1907.			Total.
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Apr.	May.	June.	
North:										
Steam	20	11	9	7	4	1	16	7	8	83
Sail	2	1	0	1	1	0	0	2	0	7
Tows	0	4	3	2	1	0	1	1	0	12
Total	22	16	12	10	6	1	17	10	8	102
Northwest:										
Steam	2	1	32	43	10	21	4	10	15	138
Sail	0	0	2	0	0	0	1	0	1	4
Tows	0	0	10	10	3	1	1	2	4	31
Total	2	1	44	53	13	22	6	12	20	173
West:										
Steam	5	10	5	32	50	8	2	4	5	121
Sail	0	1	0	1	3	0	0	0	0	5
Tows	0	0	0	23	16	2	0	1	0	42
Total	5	11	5	56	69	10	2	5	5	168
Southwest:										
Steam	18	15	24	15	9	7	4	15	1	108
Sail	0	0	0	1	0	0	1	2	0	4
Tows	1	0	3	3	1	2	0	0	0	10
Total	19	15	27	19	10	9	5	17	1	122
South:										
Steam	7	6	10	17	0	2	1	3	9	55
Sail	0	0	0	1	0	0	0	0	0	1
Tows	0	0	0	1	0	0	0	1	0	2
Total	7	6	10	19	0	2	1	4	9	58
Southeast:										
Steam	14	24	16	20	17	0	3	10	12	116
Sail	0	1	2	0	0	0	0	0	1	4
Tows	1	0	1	3	0	0	1	1	0	7
Total	15	25	19	23	17	0	4	11	13	127
East:										
Steam	12	13	1	5	2	1	3	2	3	42
Sail	0	1	1	0	0	0	0	0	1	3
Tows	0	0	0	1	0	0	1	0	0	2
Total	12	14	2	6	2	1	4	2	4	47
Northeast:										
Steam	12	27	11	21	13	3	4	19	10	120
Sail	1	3	0	1	1	0	0	1	3	10
Tows	0	3	0	3	0	0	1	4	0	11
Total	13	33	11	25	14	3	5	24	13	141
Total each month:										
Steam	90	107	108	160	105	43	37	70	63	783
Sail	3	7	5	5	5	0	2	5	6	38
Tows	2	7	17	46	21	5	5	10	4	117
Total	95	121	130	211	131	48	44	85	78	938

TABLE No. 2.—*Classified table of tonnage, by months, sheltered in the harbor of refuge at Harbor Beach, Mich., from July 1, 1906, to June 30, 1907.*

Date.	Steam.		Sail.		Tow.		Total.	
	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
1906								
July	90	80,631	3	456	2	723	95	81,810
August	107	96,750	7	808	7	4,094	121	101,652
September	108	96,553	5	1,004	17	9,809	130	107,366
October	160	144,280	5	807	46	35,018	211	180,105
November	105	95,433	5	841	21	15,168	131	111,442
December	43	43,047	0	.....	5	2,369	48	45,416
1907.								
April	37	26,112	2	239	5	2,534	44	28,885
May	70	49,266	5	908	10	4,859	85	55,033
June	63	59,196	6	520	4	1,806	73	61,522
Total	783	691,268	38	5,583	117	76,380	938	773,231

TABLE No. 3.—*Number and tonnage of vessels entering the harbor of refuge at Harbor Beach, Mich., 1877 to 1906, inclusive.*

Calendar year.	Steam.	Tow.	Sail.	Total.	Total vessels.	Average tonnage.
	Tons.	*Tons.*	*Tons.*	*Tons.*		
1877	63,966	50,954	27,699	142,619	493	289
1878	104,025	99,282	39,699	243,006	781	311
1879	133,080	100,096	45,750	278,926	921	303
1880	158,702	147,260	55,630	361,592	1,317	275
1881	144,645	127,855	55,960	328,460	1,176	279
1882	146,132	114,067	26,504	286,703	1,022	280
1883	177,122	114,091	32,713	323,926	1,139	284
1884	156,518	122,980	34,724	314,222	1,142	275
1885	196,364	151,607	29,426	377,397	1,158	325
1886	196,335	140,862	33,790	370,987	1,304	284
1887	271,327	153,087	33,680	458,094	1,447	317
1888	271,917	202,191	39,756	513,864	1,624	316
1889	289,719	165,896	37,922	493,537	1,512	326
1890	325,852	169,104	38,826	533,782	1,575	339
1891	292,917	171,067	27,076	491,060	1,341	366
1892	362,486	162,605	29,465	554,556	1,441	385
1893	243,451	113,915	20,897	378,263	982	385
1894	321,511	134,034	22,961	478,506	1,150	416
1895	356,532	167,237	26,898	550,667	1,204	457
1896	246,477	105,988	24,621	377,086	1,073	351
1897	304,460	153,776	21,151	479,387	1,205	398
1898	505,630	107,176	18,090	630,896	1,204	523
1899	590,547	81,143	20,834	692,544	1,254	544
1900	617,161	124,924	20,919	763,004	1,266	603
1901	744,154	151,023	16,841	912,018	1,338	682
1902	747,179	124,139	21,871	893,189	1,349	662
1903	662,724	105,650	12,167	780,541	1,081	722
1904	601,872	67,474	9,582	678,928	922	736
1905	695,246	94,152	10,843	800,241	1,099	728
1906	684,995	79,821	7,059	771,875	954	809
Total	10,613,046	3,803,456	843,374	15,259,876	35,474	.....

O O 6.

IMPROVEMENT OF MOUTH OF BLACK RIVER, ROUGE RIVER, AND MONROE HARBOR, MICHIGAN.

(A) MOUTH OF BLACK RIVER.

The operations during the past fiscal year were for the purpose of restoring a 16-foot depth over the area at the mouth of the Black River and along the dock front at Port Huron, which had shoaled to a certain extent. Contract (dated April 12 and approved April

24, 1907) was entered into with the Muir-O'Sullivan Dredge & Dock Co., of Port Huron, Mich., to do the work at 15½ cents per cubic yard, scow measurement. The work was begun May 8 and was still in progress at the close of the fiscal year, a total of 14,405 cubic yards having been removed.

Original estimated cost (1871) of removing middle ground to depth of—	
15 feet	$67,320.00
18 feet	157,520.00
Whole amount expended to June 30, 1907	94,073.15

Money statement.

July 1, 1906, balance unexpended	$5,613.86
Allotment from amount appropriated by river and harbor act approved March 2, 1907	1,000.00
	6,613.86
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	187.01
July 1, 1907, balance unexpended	6,426.85
July 1, 1907, outstanding liabilities	175.00
July 1, 1907, balance available	6,251.85
July 1, 1907, amount covered by uncompleted contracts	4,030.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	5,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

Mouth of Black River, in St. Clair River, Michigan:	
June 10, 1872	$15,000
St. Clair River, at mouth of Black River, Michigan:	
March 3, 1873	15,000
June 23, 1874	15,000
March 3, 1875	10,000
June 18, 1878	1,500
Mouth of Black River, Michigan:	
August 11, 1888	10,000
Mouth of Black River, Michigan—Continued.	
September 19, 1890	$10,000
July 13, 1892	10,000
August 18, 1894	4,000
June 3, 1896	4,000
March 3, 1899	4,000
June 13, 1902 (allotment)	1,000
March 2, 1907 (allotment)	1,000
Total	100,500

CONTRACT IN FORCE.

Name of contractors: Muir-O'Sullivan Dredge & Dock Co., Port Huron, Mich.
Character of work: Dredging.
Price: 15½ cents per cubic yard, scow measurement.
Date of approval: April 24, 1907.
Date of beginning work: May 8, 1907.
To be completed within 40 working days.
Time for completion extended for a reasonable period beginning June 25, 1907.

(B) ROUGE RIVER.

The dredging operations which were in progress at the beginning of the fiscal year under contract with the Muir-O'Sullivan Dredge and Dock Company, of Port Huron, Mich., at 13⅞ cents per cubic yard, scow measurement, were continued until July 28, 1906, when work under the contract was closed. A total of 37,665 cubic yards was removed, providing a 16-foot channel, with widths varying from 25 feet to 75 feet, from the mouth of the river to the Wabash Railroad bridge.

The work of securing the 21-foot depth provided by the act of March 2, 1907, was delayed somewhat pending a decision on the eight-hour law, but on May 27, 1907, advertisement inviting proposals for doing the work was published by circular letter. The bids were opened June 17, 1907, and the contract awarded to the Toledo Improvement Company, the lowest bidders, at 16 cents per cubic yard, scow measurement. The work of dredging will begin immediately after the close of the fiscal year.

Original estimated cost of the work, 1887	$31,690.39
Whole amount expended to June 30, 1907	57,327.21

Money statement.

July 1, 1906, balance unexpended	$6,993.13
Allotment from amount appropriated by river and harbor act approved March 2, 1907	7,000.00
	13,993.13
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	4,630.34
July 1, 1907, balance unexpended	9,362.79
July 1, 1907, amount covered by uncompleted contracts	3,520.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	10,000.00

APPROPRIATIONS.

August 11, 1888	$10,000
September 19, 1890	10,000
July 13, 1892	11,690
August 18, 1894	5,000
June 3, 1896	5,000
March 3, 1899 (transferred from appropriation for constructing turning basin in Rouge River, Michigan)	5,000
June 13, 1902 (allotment)	5,000
March 3, 1905 (allotment)	8,000
March 2, 1907 (allotment)	7,000
Total	66,690

CONTRACT IN FORCE.

Contract in force with the Muir-O'Sullivan Dredge and Dock Company, of Port Huron, Mich., approved May 2, 1906, for dredging the river, at 13⅞ cents per cubic yard, scow measurement; date of beginning, May 21, 1906; date of completion, July 28, 1906.

COMMERCIAL STATISTICS.

Receipts and shipments, by vessel, for the calendar year ended December 31, 1906.

[Compiled from statements furnished by those doing business along the river front.]

Articles.	Received.	Shipped.	Articles.	Received.	Shipped.
	Tons.	*Tons.*		*Tons.*	*Tons.*
Iron ore	121,610	.....	Salt	3,990	.....
Lath	4,094	.....	Shingles	281	.....
Lumber	77,346	.....	Soda ash	.....	5,000
Posts	40	.....			
Pulp wood	22,500	.....	Total	229,861	5,000

(c) HARBOR AT MONROE.

The project for the improvement of this harbor was practically completed in 1845.

During the month of June, 1907, the necessary lumber was purchased and some slight repairs were made to the decking of the piers under the direction of the local light keeper.

An examination of this harbor was made in May, 1907. The channel showed no material deterioration. No work has been done during the past fiscal year, and none is recommended for the present.

Money statement.

July 1, 1906, balance unexpended	$2,859.92
Allotment from amount appropriated by river and harbor act approved March 2, 1907	4,000.00
	6,859.92
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	650.00
July 1, 1907, balance unexpended	6,209.92

APPROPRIATIONS.

February 24, 1835	$30,000.00	March 3, 1881	$1,000.00
July 2, 1836	15,000.00	August 2, 1882	1,000.00
March 3, 1837	30,000.00	August 5, 1886	2,000.00
July 7, 1838	15,000.00	August 11, 1888	5,000.00
June 11, 1844	20,000.00	September 19, 1890	5,000.00
August 30, 1852	14,000.00	July 13, 1892	10,000.00
June 23, 1866	31,015.27	August 18, 1894	5,000.00
June 10, 1872	10,000.00	June 3, 1896	5,000.00
March 3, 1873	15,000.00	March 3, 1899	5,000.00
June 23, 1874	10,000.00	June 13, 1902 (allotment)	1,500.00
March 3, 1875	10,000.00	March 3, 1905 (allotment)	5,000.00
August 14, 1876	5,000.00	March 2, 1907 (allotment)	4,000.00
June 8, 1878	2,500.00		
March 3, 1879	2,000.00	Total	261,015.27
June 14, 1880	2,000.00		

COMMERCIAL STATISTICS.

Receipts and shipments, by vessel, for the calendar year ended December 31, 1906.

[Compiled from statements furnished by the deputy collector of customs at Monroe, Mich.]

Articles.	Received.	Shipped.
	Tons.	*Tons.*
Coal	600	12
Fish	123	342
Sand	5,800	4,480
Fishing tackle	29	2
Total	6,552	4,836

O O 7.

IMPROVEMENT OF BLACK RIVER AT PORT HURON, MICHIGAN.

The present approved project for the improvement of this river was completed in 1893. The work done since that time has been applied to maintaining the channel.

No work was in progress at this locality during the past year.

Original estimated cost of 16-foot channel, 1891	$75,000.00
Whole amount expended to June 30, 1907	46,984.40

Money statement.

July 1, 1906, balance unexpended	$127.10
Amount appropriated by river and harbor act approved March 2, 1907	6,000.00
	6,127.10
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	111.50
July 1, 1907, balance unexpended	6,015.60
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	6,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

September 19, 1890	$25,000	March 3, 1899	$4,000
July 13, 1892	10,000	March 2, 1907	6,000
August 18, 1894	4,000		
June 3, 1896	4,000	Total	53,000

COMMERCIAL STATISTICS.

Receipts, by vessel, for the calendar year ended December 31, 1906.

[Compiled from statements furnished by the collector of customs at Port Huron, Mich.]

Articles.	Received.	Articles.	Received.
	Tons.		*Tons.*
Brick	500	Shingles	1,750
Cedar posts	1,170	Pulpwood	31,500
Coal	53,180	Wood	460
Gravel	30,799		
Lath	1,500	Total	135,695
Lumber	14,836		

O O 8.

IMPROVEMENT OF PINE RIVER, MICHIGAN.

The work of improving this river, in accordance with present approved project, was completed in 1899.

No work was done during the past fiscal year.

The dredged channel is probably in good condition, and the balance from the last appropriation will be sufficient to meet all cost of maintenance and general contingencies for some time to come.

Original estimated cost of work, 1895	$10,560.00
Whole amount expended on present project to June 30, 1907	9,677.86

Money statement.

July 1, 1906, balance unexpended	$950.21
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	68.07
July 1, 1907, balance unexpended	882.14

APPROPRIATIONS.

March 3, 1875	$5,000
June 3, 1896	5,000
March 3, 1899	5,560
Total	15,560

COMMERCIAL STATISTICS.

Receipts and shipments, by vessel, for the calendar year ended December 31, 1906.

[Compiled from statements furnished by the deputy collector of customs at St. Clair, Mich.]

Articles.	Received.	Shipped.
	Tons.	*Tons.*
Brick		6,000
Coal	7,495	
Total	7,495	6,000

O O 9.

IMPROVEMENT OF BELLE RIVER, MICHIGAN.

The present project for the improvement of this river was completed in 1899. No work was done during the past fiscal year. No additional appropriation is necessary, as the unexpended balance of the last one will provide for all probable expenses of maintenance, etc., for some time to come.

Original estimated cost of work, 1895	$21,340.00
Whole amount expended on present project to June 30, 1907	11,158.16

Money statement.

July 1, 1906, balance unexpended	$3,909.54
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	67.70
July 1, 1907, balance unexpended	3,841.84

APPROPRIATIONS.

March 3, 1881 (ice harbor of refuge)	$7,000
August 2, 1882 (ice harbor of refuge)	5,000
July 5, 1884 (ice harbor of refuge)	2,000
June 3, 1896	5,000
March 3, 1899	10,000
Total	29,000

COMMERCIAL STATISTICS.

Receipts and shipments, by vessel, for the calendar year ended December 31, 1906.

[Compiled from statements furnished by the deputy collector of customs at Marine City, Mich.]

Articles.	Received.	Shipped.
	Tons.	*Tons.*
Cedar posts	460	180
Coal	6,000	132
Gravel	2,437	.....
Lumber	3,870	966
Oak ship timbers	187	.....
Total	12,954	1,278

O O 10.

IMPROVEMENT OF CLINTON RIVER, MICHIGAN.

The work of removing the shoals which had formed in this river was begun June 18, 1907, under a lease with the Toledo Dredge and Dock Company, of Toledo, Ohio, dated June 17, 1907, for the hire of a dredging plant at $20 per hour, and was still in progress at the close of the fiscal year.

Plans were made for the reconstruction of the pile dike at the mouth of the river, but when the proposals for the work were received they were considered excessive, and the rejection of all bids was authorized by the Chief of Engineers April 6, 1907. It was then decided to defer further action in the matter until sufficient funds had been appropriated to do the necessary work and to apply the funds on hand to dredging work.

Original estimated cost of work, 1885, as amended 1899	$34,564.00
Whole amount appropriated and expended prior to adoption of present project	25,500.00
Whole amount expended on present project to June 30, 1907	47,811.69

Money statement.

July 1, 1906, balance unexpended	$4,993.31
Amount appropriated by river and harbor act approved March 2, 1907	2,500.00
	7,493.31
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	241.00
July 1, 1907, balance unexpended	7,252.31
July 1, 1907, outstanding liabilities	2,500.00
July 1, 1907, balance available	4,752.31
July 1, 1907, amount covered by uncompleted contracts	3,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	10,000.00

APPROPRIATIONS.

August 30, 1852	$5,000	July 13, 1892	$8,564
July 11, 1870	5,000	August 18, 1894	5,000
March 3, 1871	1,500	June 3, 1896	10,000
March 3, 1881	8,000	March 3, 1905	3,000
August 2, 1882	6,000	March 2, 1907	2,500
August 5, 1886	6,000		
August 11, 1888	10,000	Total	80,564
September 19, 1890	10,000		

CONTRACT IN FORCE.

Name of contractor: The Toledo Dredge and Dock Company, of Toledo, Ohio.
Character of work: Dredging by means of leased dredging plant.
Price: $20 per hour.
Date of beginning: June 18, 1907.
Date of expiration: July 12, 1907.

COMMERCIAL STATISTICS.

Receipts and shipments, by vessel, for the calendar year ended December 31, 1906.

[Compiled from statements furnished by the collector of customs at Detroit, Mich.]

Articles.	Received.	Shipped.	Articles.	Received.	Shipped.
	Tons.	*Tons.*		*Tons.*	*Tons.*
Coal	11,500		Stone	313	
Lime and cement	77		Sand	3,100	
Logs	1,617		Heading		284
Lumber	8,925				
Salt	84		Total	25,616	284

APPENDIX P P.

IMPROVEMENT OF WATERS CONNECTING THE GREAT LAKES.

REPORT OF COL. CHAS. E. L. B. DAVIS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Ship channel connecting waters of the Great Lakes between Chicago, Duluth, and Buffalo.
2. St. Marys River at the Falls, Michigan.
3. Operating and care of St. Marys Falls Canal, Michigan.
4. Hay Lake and Neebish channels, St. Marys River, Michigan.
5. St. Clair Flats Canal, Michigan.
6. Operating and care of St. Clair Flats Canal, Michigan.
7. Detroit River, Michigan.
8. Removing sunken vessels or craft obstructing or endangering navigation.

UNITED STATES ENGINEER OFFICE,
Detroit, Mich., July 9, 1907.

GENERAL: I have the honor to submit herewith the annual report relative to the works under my charge during the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

CHAS. E. L. B. DAVIS,
Colonel, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

P P 1.

IMPROVEMENT OF SHIP CHANNEL CONNECTING WATERS OF THE GREAT LAKES BETWEEN CHICAGO, DULUTH, AND BUFFALO.

The work in progress is, under the project of 1892, contemplating a navigable depth of 20 feet at mean stage of water by excavating channels of a minimum width of 300 feet through the shallows of the connecting waters of the Great Lakes between Chicago, Duluth, and Buffalo. The improved channels were made available in 1897; but as the water levels have been almost continuously below the mean

stage, the actual navigable depth has been 1 to 3 feet less than 20 feet. The operations during the past fiscal year were as follows:

Detroit River and St. Clair River and Lake.—No dredging was done under this project during the year.

The channel between the foot of Grosse Pointe Cut and Windmill Point was surveyed and platted. An examination was also made of the channel opposite Fort Gratiot Light.

Although the Government had improved the channel to the westward of Stag Island in St. Clair River, navigators still confined themselves to the eastern channel. In order to compel the use of the western channel and thus minimize the danger of collision at this point, regulations were promulgated by the Secretary of War under date of January 8, 1907, directing all through upbound boats to pass through the eastern channel, and all downbound boats through the western channel. To enforce these regulations, watchmen have been stationed at this place to report all violations.

This work is under the local charge of Chief Assistant Engineer E. S. Wheeler.

St. Marys River.—Under contract with M. Sullivan, dated June 6, 1906, the channel through Round Island shoal No. 1 was widened 200 feet. Two dredges and one derrick boat were employed and worked 574.7 hours, and removed 69,440 cubic yards of clay, stones, and bowlders. The work was completed 119 days before the expiration of contract time.

Under contract dated May 25, 1906, with the Lake Erie Dredging Company, the channel through Round Island shoal No. 2 was widened 175 feet. Two dredges were employed and worked 897.3 hours and removed 128,185 cubic yards of sand, clay, stones, and bowlders from an area of 52,416 square yards. This improvement is completed with the exception of removing some scattering bowlders. The channel through Round Island shoals 1 and 2 is improved to a depth of 23 feet below 601.5.

The deepening of the Vidal shoals to 22 feet below 601.5 was continued. One dredge employed by the working hour worked 196.5 hours and removed 10,501 cubic yards of sand, gravel, clay, and bowlders from an area of 2,670 square yards. One derrick boat employed by the working hour worked 926.3 hours, and removed 1,785 cubic yards of bowlders and broken stone from an area of 76,700 square yards.

Surveys were made on all the sections on which work was in progress or contemplated, and the 16,000 soundings taken are being mapped and used in computing estimates.

The supervision of this work has been in charge of Assistant Engineer L. C. Sabin.

Money statement.

July 1, 1906, balance unexpended	$80,496.40
June 30, 1907, amount expended during fiscal year, for works of improvement	69,099.20
July 1, 1907, balance unexpended	11,397.20
July 1, 1907, outstanding liabilities	4,662.91
July 1, 1907, balance available	6,734.29
July 1, 1907, amount covered by uncompleted contracts	2,380.91

APPROPRIATIONS.

July 13, 1892	$375,000	June 4, 1897	$1,090,000
March 3, 1893	875,000		
March 2, 1895	500,000	Total	3,340,000
June 11, 1896	500,000		

CONTRACTS IN FORCE.

CONTRACT DATED JULY 8, 1905.

Name of contractor: Semande & Durocher, Sault Ste. Marie, Mich.
Amount and character of work: About $2,000 under this appropriation; time work by steam-derrick boat, etc.
Price per unit: $5 per working hour; dynamite, 14 cents per pound.
Date of approval: July 21, 1905.
Date of beginning of work: August 4, 1905.
Date of expiration and completion: July 10, 1906.

CONTRACT DATED MAY 25, 1906.

Name of contractor: The Lake Erie Dredging Company, Buffalo, N. Y.
Amount and character of work: About $35,000; dredging Item A_2, Round Island shoal 2.
Price per unit: 49 cents per cubic yard, bank measurement (full rate), and 24½ cents per cubic yard, bank measurement (half rate).
Date of approval: June 5, 1906.
Date of beginning work: July 24, 1906.
Date of expiration: About July 15, 1907 (150 good working days).

CONTRACT DATED JUNE 6, 1906.

Name of contractor: M. Sullivan, Buffalo, N. Y.
Amount and character of work: About $17,000; dredging Item A_1, Round Island shoal 1.
Price per unit: 29½ cents per cubic yard, bank measurement (full rate), and 14¾ cents per cubic yard, bank measurement (half rate).
Date of approval: June 15, 1906.
Date of beginning of work: August 6, 1906.
Date of expiration: About June 30, 1907 (150 good working days).
Date of completion: October 4, 1906.

EMERGENCY CONTRACT DATED JULY 2, 1906.

Name of contractor: Great Lakes Dredge and Dock Company, Chicago, Ill.
Amount and character of work: About $5,900; time work by dredging plant.
Price per unit: $30 per working hour.
Date of beginning of work: July 2, 1906.
Date of expiration and completion: July 17, 1907.

EMERGENCY CONTRACT DATED JULY 9, 1906.

Name of contractor: Semande & Durocher, Sault Ste. Marie, Mich.
Amount and character of work: About $5,900; time work by steam-derrick boat, etc.
Price per unit: $6 per working hour; dynamite, 14 cents per pound.
Date of beginning of work: July 11, 1906.
Date of expiration and completion: June 29, 1907.

P P 2.

IMPROVEMENT OF ST. MARYS RIVER AT THE FALLS, MICHIGAN.

The work now in progress comprises the construction of a movable dam, the acquisition of lands, etc., covered by the project of 1886, and its extensions; also the canal widening and further improvement authorized by *the river and harbor* act of June 13, 1902, and the con-

struction of a new lock and canal provided for by the river and harbor act of March 2, 1907.

The total expenditures up to June 30, 1907, under the several projects for improving St. Marys River at the falls are $4,597,665.98, less $23.55 (refundment of International Waterways Commission funds during fiscal year 1907)=$4,597,642.43, leaving a balance of $2,117,926.79 available for the payment of outstanding liabilities and for further work.

Of the diversions authorized by the acts of June 13, 1902, $20,000 has been expended for special work at Sailors Encampment; of the $20,000 for an international commission $1,727.77, less $23.55= $1,704.22, has been expended for that purpose, and the balance, $18,272.23+$23.55=$18,295.78, transferred to the Commission, and $86,491.28 has been expended for the St. Clair Flats Canal work.

The operations for the fiscal year were as follows:

The purchase of lands needed for canal purposes included the acquisition of 0.43 acre north of Water street at the appraised value of $36,200; the portion of River street, north of Water street, deeded by the city of Sault Ste. Marie for a nominal consideration of $1, and 6.52 acres on north side of canal deeded to the United States by the Chandler-Dunbar Water Power Company for the nominal sum of $1, the previous deed by this company not having been accepted. There remain to be secured Island No. 5; one lot on north side of Water street, containing 0.06 acre, at appraised value of $4,000; quitclaim deed from the Sault Ste. Marie Bridge Company to 0.84 acre, required by present plans for canal widening, and quitclaim deed from the St. Marys Power Company of its claim to a portion of the lands deeded by the Chandler-Dunbar Water Power Company; also some additional lands north of the present canal required for the lock and canal under new project.

The work of widening the canal having been delayed because satisfactory title to the lands needed could not be obtained, new plans and specifications were prepared for this work and have been approved, and the advertisement of the work is only delayed pending the approval of deed from the Chandler-Dunbar Company and the receipt and approval of quitclaim deeds from the Sault Ste. Marie Bridge Company and the St. Marys Power Company of the lands and interests mentioned above.

New designs were prepared for movable dam to be built across present canal and proposed widening, but details of machinery have not been completed; the work on substructure was begun during the closed season of navigation by day labor. This work included the construction of cofferdams across the canal, the excavation of 882 cubic yards of material, principally rock, and the placing of 1,119 cubic yards of concrete. The substructure was not completed at the opening of navigation when work was suspended.

The stone crusher was erected at West Neebish Rapids, convenient to the spoil banks from the rock cut, and about 1,900 cubic yards of crushed stone have been delivered at the canal for use in movable dam and piers.

One thousand four hundred and fifty-eight barrels of cement were purchased under contract and submitted to the usual tests. The sand used was purchased under public notice, 865 cubic yards being *delivered.*

Work on the new lock and canal included surveys and estimates and studies of walls, culverts, and floor.

The operations of the Michigan Lake Superior Power Company and the Chandler-Dunbar Water Power Company, under their permits, were inspected and conditions reported. On account of the water level of Lake Superior having reached a point below elevation 601.5 feet in January, the Michigan Lake Superior Power Company was ordered on February 21, 1907, to decrease the flow through its canal in accordance with the terms of its permit; and as the level continued to fall, a still greater reduction of flow was ordered on March 4, 1907. As the height of the water increased in April, the Company was permitted to increase the flow, and on April 22, 1907, the restrictions in regard to flow were removed.

The changes in St. Marys River were noted for use in preparing Lake Survey Bulletin No. 16.

Daily readings of water gauges above and below the locks were made throughout the year, and the monthly means and differences are as follows:

[Elevation, in feet, above mean tide at New York, levels of 1877.]

Month.	Monthly means.		Mean difference.	Month.	Monthly means.		Mean difference.
	Above locks.	Below locks.			Above locks.	Below locks.	
1906.	*Feet.*	*Feet.*	*Feet.*	1907.	*Feet.*	*Feet.*	*Feet.*
July	602.34	583.054	19.286	January	601.404	583.448	17.956
August	602.29	583.049	19.241	February	601.223	583.551	17.672
September	602.33	582.908	19.422	March	601.141	583.033	18.108
October	602.175	582.691	19.484	April	601.389	582.268	19.121
November	601.91	582.49	19.42	May	601.516	582.219	19.297
December	601.776	582.541	19.235	June	601.921	582.618	19.303

The supervision of this work has been in charge of Assistant Engineer L. C. Sabin.

Money statement.

[For detailed money statements see page 689.]

July 1, 1906, balance unexpended		$831,654.57
Amount appropriated by river and harbor act approved March 2, 1907		1,200,000.00
Amount appropriated by sundry civil act approved March 4, 1907		250,000.00
		2,281,654.57
June 30, 1907, amount expended during fiscal year, for works of improvement		[a] 163,727.78
July 1, 1907, balance unexpended		2,117,926.79
July 1, 1907, outstanding liabilities		2,645.88
July 1, 1907, balance available		2,115,280.91
Amount (estimated) required for completion of existing project:		
Canal widening, etc	$250,000.00	
New lock and canal	5,000,000.00	
		5,250,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907		250,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.		

[a] Includes $86,491.28 expended for improving St. Clair Flats Canal, Michigan, and $4.17 paid by Treasury Department, account of D., S. S. & A. Ry. Co.

APPROPRIATIONS.

On past finished projects of 1856 to 1885, $2,875,692, including $10,000 diverted from Great Lakes harbors appropriation of 1864.

On present projects.

August 5, 1886	$250,000	March 3, 1905	$420,000
August 11, 1888	1,000,000	June 30, 1906	100,000
September 19, 1890	900,000	March 2, 1907	1,200,000
March 3, 1891	600,000	March 4, 1907	250,000
March 3, 1893	1,230,000		
August 18, 1894	300,000	Total	6,733,865
March 2, 1895	483,865		

CONTRACTS IN FORCE.

EMERGENCY CONTRACT DATED AUGUST 9, 1906.

Name of contractor: J. A. Lamontagne, Sault Ste. Marie, Mich.
Amount and character of work: $3,360 under this appropriation; furnishing and delivering limestone rock.
Price per unit: Forty-eight cents per cubic yard.
Date of beginning of work: September 5, 1906.
Date of expiration: April 1, 1907.
Date of completion: November 2, 1906. (Contractor released.)

EMERGENCY CONTRACT DATED DECEMBER 20, 1906.

Name of contractor: Alpena Portland Cement Company, Alpena, Mich.
Amount and character of work: $2,697.30; furnishing and delivering Portland cement.
Date of beginning of work: December 10, 1906.
Date of expiration: January 20, 1907.
Date of completion: February 26, 1907.

P P 3.

OPERATING AND CARE OF ST. MARYS FALLS CANAL.

During the fiscal year the canal was open to navigation, two hundred and thirty-nine days, the closed period of one hundred and twenty-six days being from December 18, 1906, to April 22, 1907. During the open period there passed through the canal 45,013,198 tons of freight, an increase of 3,736,336 tons over the tonnage for the fiscal year 1906.

The total delays that occurred in locking vessels amount to one hundred and seventy-one hours and three minutes, of which forty-three hours and thirty minutes occurred at the Poe lock and one hundred and twenty-seven hours and thirty-three minutes at the Weitzel lock.

The accidents resulting in damage to property were minor ones, and those to persons were not serious.

During the closed period of navigation repairs were made to both locks.

The very complete statistics of lake commerce passing through the American and Canadian canals during the season of 1906, compiled *from the official* records of the St. Marys Falls Canal, are appended.

The estimated amount required for the year ending June 30, 1908, is $115,000, to be applied approximately as follows: For pay rolls, $89,500; for repairs, $14,100; for general supplies, $5,400; for electric lighting of buildings, locks, and grounds, $3,000, and for general contingencies, including office expenses, $3,000.

More extended information regarding details of service, repairs, accidents, etc., is given in the following extract from the report of Mr. L. C. Sabin, general superintendent of the canal.

ORGANIZATION.

The regular force of 93 persons, viz, 1 general superintendent, 1 superintendent, 4 clerks, 1 chief engineman, 3 assistant superintendents, 1 overseer, 6 lockmasters, 6 enginemen, 7 watchmen, 1 storekeeper, 2 recorders, 3 messengers, 9 first-grade lockmen, 9 second-grade lockmen, 15 third-grade lockmen, and 24 linemen, were severally employed from nine to twelve months in locking boats, office work, and care of property. There were 13 laborers employed ten months in repairing piers, grading, and care of grounds. A carpenter, painter, mason, and calker were occasionally employed.

Assistant Superintendent John McNaughton was separated from the service by death on May 11, 1907.

REPAIRS.

The ordinary maintenance and fitting-out repairs included the repair or renewal of all damaged, worn-out, or broken parts of operating machinery, replacing of broken masonry with concrete, refilling piers, the painting of gates, snubbing posts, and electric light poles, and testing of all machinery.

One hundred and five loose culvert rods in Poe lock were cut and threaded and supplied with turn-buckles, and 275 feet of lock floor adjusted and leveled.

Forty-seven cubic yards of stone that had fallen from south face of Poe lock wall was removed from lock floor.

Twenty snubbing posts on north and south walls of Poe lock were replaced with cast-iron snubbing buttons, set in concrete.

A plank conduit was built around pressure pipes between wall engines operating intermediate and lower lock gates on north side of Poe lock.

The broken straps and bolts of upper guard gates of the Weitzel lock were repaired, the two intake valves in each leaf overhauled and adjusted, and decking of gates renewed.

The derrick outfit of Semande & Durocher was employed 217 hours and 35 minutes at $6 per hour, removing accumulations of loose rock from lock floor and vicinity of lower guard gates, Poe lock, upon which vessels were grounding. Three hundred and forty-four cubic yards were removed.

At the close of navigation, December 17, 1906, the locks were unwatered and machinery laid up for the winter. The canal head gates were closed and the water drawn down to level of lock miter sill, and leakage into canal removed by operating the steam pumping plant from February 19 to April 8 while constructing concrete piers and abutments of new movable dam.

ACCIDENTS.

Four sailors were injured, one having his leg broken by getting caught in bight of line, and another his hand crushed by a cable; the third had his shoulder dislocated in landing from boat to pier, and the fourth his foot jammed. Two canal employees were injured by falling into Weitzel lock from gate scaffolding; one escaped with a gash in the face and the other with a broken rib.

The collar strap on south leaf of lower operating gate, Weitzel lock, broke while closing gate, and was replaced with a new one.

There were 46 minor accidents, resulting in pulling out 4 snubbing posts, breaking 12 timbers in piers, the concrete of north abutment of new movable dam, 24 pieces of stone from lock walls, 3 iron straps, 1 timber, tie rod and some decking in Weitzel lock gates, shearing some rivets off and bruising decking of Poe lock gates.

The barges *Montezuma* and *Mather* were slightly injured by colliding in canal.

The steamer *Crescent City*, bound up, while awaiting lockage was struck by the steamer *Snyder*, damaging the former some.

The schooner *Marvin* ran into the stern of the steamer *Rensselaer*, damaging her fantail.

While the steamer *Alva*, upbound, was tied up at northeast pier, awaiting lockage, the steamer *Wisconsin*, in attempting to tie up alongside, collided with the *Alva*, punching a hole in her abreast of boiler room. The *Wisconsin* was badly injured also.

The steamer *David Z. Norton* and barge *John A. Roebling* collided at canal safety gates, damaging the *Norton*.

The steamer *Pathfinder* broke two plates in her port bow by striking the northwest pier while making a landing.

While slowly entering the canal, the current at intake of the Michigan Lake Superior Power Company's canal drew the steamer *Saxona* into the entrance of the power canal; her bow struck the southwest pier, but the stern was drawn into the power canal, where she grounded, sustaining some damage.

DELAYS.

Poe lock.—The delays to navigation in the Poe lock amounted to forty-three hours and thirty minutes, as follows: Three hours twenty-five minutes, due to removing rope fenders from miter sills; four hours thirty minutes, removing loose stone from miter sills; one hour twenty minutes, repairing gate cables; thirty-five minutes, fouling of cables on steamers; thirty minutes, grounding of steamer below lock, and thirty-three hours ten minutes, pumping out lock, repacking valve engines, and filling pressure pipes with oil, preparatory to operating during cold weather.

Weitzel lock.—In this lock the delays amounted to one hundred and twenty-seven hours and thirty-three minutes, as follows: Fifteen minutes, due to replacing gate cable on sheave; seven hours forty-five minutes, repairing east operating gates; forty-six hours, replacing broken collar strap on south leaf of lower operating gate; seventy-three hours thirty-three minutes, pumping out lock, repacking valve engines, preparatory to filling pressure pipes with oil, and tightening *truss rods on* lower gates.

In addition to the above delays navigation through the canal was blocked for two hours fifty minutes by the steamers *Perkins* and *Steinbrenner* becoming jammed below the canal head gates while attempting to pass each other.

PERMITS.

The Edison Sault Electric Company, under Secretary of War permit dated May 8, 1905, completed construction of power house and tailrace in the rapids and commenced utilizing power therefrom June 1, 1907.

SEMAPHORE.

On July 28, 1906, a semaphore was established at watch station on northwest pier, consisting of a pole 28 feet long, painted white, with a swinging arm 8 feet long, painted red, for purpose of signaling vessels when locks are being filled.

Money statement.

Expenditures to June 30, 1906		$1,401,474.73
Outstanding liabilities June 30, 1906		7,364.18
Total expenses to June 30, 1906		1,408,838.91
Expended during fiscal year ending June 30, 1907	[a] $89,827.26	
Deduct outstanding liabilities pertaining to preceding year	7,364.18	
	82,463.08	
Add outstanding liabilities June 30, 1907	9,151.11	
		91,614.19
Total expenses to June 30, 1907 (including outstanding liabilities)		1,500,453.10

CONTRACTS IN FORCE.

EMERGENCY CONTRACT DATED AUGUST 21, 1906.

Name of contractor: F. B. Spear & Sons, Marquette, Mich.
Amount and character of work: $1,992.09; furnishing and delivering 971¾ barrels of Portland cement.
Price per unit: $2.05 per barrel.
Date of beginning of work: September 4, 1906.
Date of expiration: September 20, 1906; Completed September 20, 1906.

Summary of expenses for operating and care of St. Marys Falls Canal, Michigan, for the fiscal year ending June 30, 1907.

Pay rolls	$75,063.96
Repair material	6,709.47
General supplies	5,221.16
Electric lighting	2,921.92
Contingencies	1,697.68
Total	91,614.19

[a] Includes $2.23 paid by Treasury Department account of D. S. S. & A. Ry. Co. and $40 deposited to credit of appropriation "Survey of N. & N. W. Lakes."

Estimate.

Amount (estimated) for fiscal year ending June 30, 1908	$115,000.00
Balance from allotment for preceding year	8,000.00
Additional allotment required for fiscal year ending June 30, 1908	107,000.00

Expenses for operating and care of St. Marys Falls Canal, Michigan.

1882	$31,207.48	1896	$60,763.28
1883	35,509.70	1897	78,104.05
1884	31,212.93	1898	58,890.72
1885	27,242.45	1899	90,307.94
1886	25,400.95	1900	79,293.26
1887	22,138.92	1901	75,475.33
1888	29,898.72	1902	87,693.80
1889	30,749.45	1903	83,876.80
1890	34,323.85	1904	93,248.47
1891	48,330.89	1905	85,246.35
1892	61,389.74	1906	89,999.95
1893	42,412.12	1907	91,614.19
1894	55,213.09		
1895	50,908.67	Total	1,500,453.10

Statement of receipts and expenses for fiscal year ending June 30, 1907.

Receipts:	
Balance at close of fiscal year ending June 30, 1906	$5,182.24
July 16, 1906 (allotment)	95,000.00
	100,182.24
Expenses	91,614.19
Balance at close of fiscal year ending June 30, 1907	8,568.05

COMMERCIAL STATISTICS.

Statistical report of lake commerce through canals at Sault Ste. Marie, Michigan and Ontario, for the fiscal year ending June 30, 1907.

Items.	United States canal.	Canadian canal.	Totals.
Vessel passages ... number	15,653	5,788	21,441
Lockages ... do	9,925	4,183	14,108
Net tonnage:			
Registered	33,716,538	8,563,889	42,280,427
Freight	45,013,198	9,648,421	54,661,619
Passengers ... number	29,248	31,618	60,866
Coal:			
Hard ... net tons	1,062,930	192,302	1,255,232
Soft ... do	7,264,013	1,658,700	8,922,713
Flour ... barrels	3,816,643	2,810,024	6,626,667
Wheat ... bushels	54,720,532	38,213,236	92,933,768
Grain, other than wheat ... do	30,139,877	20,324,518	50,464,395
Manufactured and pig iron ... net tons	277,877	86,288	364,165
Salt ... barrels	383,463	90,401	473,864
Copper ... net tons	85,976	9,456	95,432
Iron ore ... do	31,688,607	5,141,899	36,830,506
Lumber ... 1,000 feet B. M.	793,054	52,402	845,456
Building stone ... net tons	6,222	.....	6,222
General merchandise ... do	498,651	560,896	1,059,547

NOTE.—The United States canal was open to navigation 239 days during the fiscal year. The Canadian canal was open to navigation 245 days during the fiscal year.

Comparative statement of commerce through St. Marys Falls Canal, Michigan, for the fiscal years 1906 and 1907.

		Fiscal year.		Increase.	Decrease.
		1906.	1907.		
Vessel passages	number	16,299	15,653		646
Lockages	do	10,016	9,925		91
Net tonnage:					
Registered		32,559,602	33,716,538	1,156,936	
Freight		41,276,862	45,013,198	3,736,336	
Passengers	number	29,344	29,248		96
Coal	net tons	6,047,213	8,326,943	2,279,730	
Flour	barrels	4,556,985	3,816,643		740,342
Wheat	bushels	51,146,562	54,720,532	3,573,970	
Grain, other than wheat	do	40,004,666	30,139,877		9,864,789
Manufactured and pig iron	net tons	244,626	277,877	33,251	
Salt	barrels	294,003	383,463	89,460	
Copper	net tons	96,283	85,976		10,307
Iron ore	do	29,828,694	31,688,607	1,859,913	
Lumber	M feet B. M.	929,141	793,054		136,087
Silver ore	net tons	41			41
Building stone	do	6,261	6,222		39
General merchandise	do	523,687	498,651		25,036

Summary of traffic through St. Marys Falls Canal, Michigan, for the fiscal year ending June 30, 1907.

Number of vessels through Weitzel lock	6,139	
Number of vessels through Poe lock	9,514	
		15,653
Number of lockages through Weitzel lock	4,250	
Number of lockages through Poe lock	5,675	
		9,925
Total registered tonnage		33,716,538
Total freight tonnage		45,013,198

Total time spent in making lockages, 4,995 hours 15 minutes.
Average time spent in making lockages, 30 minutes 12 seconds.
Total time spent by vessels in passing locks, 7,670 hours 17 minutes.
Average time spent by vessels in passing locks, 29 minutes 24 seconds.

Cost per lockage		$9.23
Cost per passage		$5.85
Cost per registered ton	mills	2.72
Cost per freight ton	do	2.04

The Weitzel lock was open to navigation two hundred and twenty-two days, from July 1 to December 5, 1906, and from April 28 to June 30, 1907.

The time for the Poe lock was two hundred and thirty-nine days, July 1 to December 17, 1906, and from April 23 to June 30, 1907.

Compared with the previous fiscal year the commerce through St. Marys Falls Canal, Michigan, shows an increase in the following items: Registered tonnage, 4 per cent; freight tonnage, 9 per cent; coal, 38 per cent; wheat, 7 per cent; manufactured and pig iron, 14 per cent; salt, 30 per cent; and iron ore, 6 per cent. A decrease is shown in the following items: Passages, 4 per cent; lockages, 1 per cent; flour, 16 per cent; grain other than wheat, 25 per cent; copper, 11 per cent; lumber, 15 per cent; building stone, 1 per cent; and general merchandise, 5 per cent.

In comparing the total traffic through the American and Canadian canals at Sault Ste. Marie, Michigan and Ontario, with the previous fiscal year, it shows an increase as follows: Registered tonnage, 13 per cent; freight tonnage, 19 per cent; passengers, 10 per cent; and a decrease of 2 per cent in the number of passages.

The total freight traffic of 54,661,619 tons is the largest in the history of the canals, and exceeds that of last year by 8,646,603 tons.

STATISTICS OF LAKE COMMERCE PASSING THROUGH THE AMERICAN AND CANADIAN CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO, DURING THE SEASON OF 1906.

[Compiled from official records at St. Marys Falls Canal, Michigan.]

SOURCES OF INFORMATION FOR TRAFFIC DATA AND VALUATIONS.

Freight tonnage and passengers.—The freight unit used and designated as a "net ton" means in every instance a ton of 2,000 pounds. The data relative to freight and passengers were compiled from reports made by vessel masters when passing through the American and Canadian canals. As a daily exchange of these reports is made with Superintendent J. C. Boyd, of the Canadian canal, both offices have record of the entire lake traffic to and from Lake Superior.

Registered tonnage and vessel valuations.—The registered tonnage, as given, was obtained from vessel papers and blue books. Vessel valuations were obtained from Inland Lloyds.

Freight rates.—These were compiled from quotations published in the Marine Review and from information obtained from shippers, owners, and carriers of the several classes of freight. The freight rates given are for lake transportation and include cost of loading and unloading.

Freight valuations.—The unit values used for the various items of freight were derived by taking the mean for the season of each monthly average as obtained from daily or weekly prices current.

The sources of the valuations given are as follows: Coal, quotations in Coal Trade Journal at Duluth and Superior; cereals, Daily Commercial Record, published by Duluth Board of Trade; flour, daily quotations in Duluth, Superior, and Minneapolis journals; iron ore and pig iron, weekly quotations in Iron Trade Review, Marine Review; salt, quotations at Lake Superior ports; copper, general merchandise, lumber, building stone, and manufactured iron, quotations by the principal shippers, owners, and carriers.

To quotations given at point of shipment, freight rates are added to lake ports of destination.

The compilation was done by the clerical force in the United States canal office at Sault Ste. Marie, Mich., under the supervision of General Superintendent L. C. Sabin.

American and Canadian canals.—The total freight traffic of 51,751,080 net tons for the season of 1906, when compared with season of 1905, shows an increase of 17 per cent, or 7,480,400 tons, and the net registered tonnage of 41,098,324 shows an increase of 12 per cent, or 4,480,625.

The items showing an increase are coal, flour, wheat, grain other than wheat, manufactured and pig iron, salt, iron ore, copper, and general merchandise.

The total number of passengers was 63,033, an increase of 8,829, or 16 per cent.

The passages through both canals numbered 22,155, showing a gain of 476, or 2 per cent.

The total lockages numbered 14,523, a gain of 731, or 5 per cent.

The season of navigation continued for a period of eight months and nine days, during which time the average monthly freight traffic was 6,235,070 net tons and 4,951,605 net registered tons.

The depth of water in entrance channels and through the canals and locks permitted a safe draft of 19½ feet.

American canal.—The traffic through the American canal was 87 per cent of the total freight, 85 per cent of the total net registered tonnage, and 49 per cent of the total number of passengers carried, the amounts being 45,180,292 tons of freight, 34,789,793 registered tons, and 30,925 passengers. Compared with the season of 1905, there was an increase of 6,378,102 tons of freight, or 16 per cent; 3,668,560 registered tons, or 12 per cent; and 2,524 passengers, or 9 per cent.

The American canal opened April 13 and closed December 17, 1906, making the length of its season two hundred and forty-nine days.

Canadian canal.—The traffic through the Canadian canal was 13 per cent of the total freight, 15 per cent of the total registered tonnage, and 51 per cent of the passengers carried, the amounts being 6,570,788 tons of freight, 6,308,531 registered tons, and 32,108 passengers. Compared with the season of 1905, there was an increase of 1,102,298 tons of freight, or 20 per cent; 812,065 registered tons, or 15 per cent; and 6,305 passengers, or 24 per cent.

The Canadian canal was opened April 14 and closed December 22, 1906, making the length of its season two hundred and fifty-three days.

GENERAL SUMMARY.

[For American and Canadian canals together.]

Total freight carried	tons	51,751,080
Total net registered tons		41,098,324
Total mile tons		43,596,953,680
Total valuation placed on freight carried		$537,463,454
Total amount paid for freight transportation		$36,666,889
Total number of registered vessels using canals		879
Total number of passages by unregistered crafts carrying freight		810
Total valuation placed on registered vessels		$94,532,500
Total number of passengers transported		63,033
Average distance freight was carried	miles	842.4
Average cost per ton for freight transportation		$0.71
Average cost per mile per ton	mills	.84
Average value per ton of freight carried		$10.39
Time American canal was operated	days	249
Time Canadian canal was operated	do	253
Freight carried by—		
Registered vessels	tons	51,652,262
Unregistered vessels	do	98,818
American vessels	per cent	95
Canadian vessels	do	5
Passengers carried by—		
American vessels	do	43
Canadian vessels	do	57
Average number of vessels passing per day—		
Through Poe lock		40
Weitzel lock		28
Canadian lock		22
Poe, Weitzel, and Canadian locks		87

East and west bound commerce passing both American and Canadian canals at Sault Ste. Marie, Michigan and Ontario, for the season of 1906.

EASTBOUND.

Articles.	United States canal.	Canadian canal.	Total.	Total net tons.
Copper ... net tons	99,572	8,061	107,633	107,633
Grain ... bushels	37,661,898	16,674,508	54,336,406	1,240,541
Building stone ... net tons	6,222	.....	6,222	6,222
Flour ... barrels	4,091,300	2,393,454	6,484,754	648,475
Iron, ore ... net tons	32,453,645	2,903,397	35,357,042	35,357,042
Iron, pig ... do	17,536	3,383	20,919	20,919
Lumber ... M feet B. M.	854,167	46,464	900,631	1,525,348
Silver ore ... net tons	.....	.....	.....	.....
Wheat ... bushels	49,977,831	34,293,527	84,271,358	2,528,139
General merchandise ... net tons	59,394	91,192	150,586	150,586
Passengers ... number	15,072	16,733	31,805	.....

WESTBOUND.

Coal:				
Hard ... net tons	872,383	138,992	1,011,375	1,011,375
Soft ... do	6,634,006	1,094,249	7,728,255	7,728,256
Flour ... barrels	8,724	1,872	10,596	1,060
Grain ... bushels	.....	6,749	6,749	114
Manufactured iron ... net tons	286,785	83,401	370,186	370,186
Salt ... barrels	371,680	96,482	468,162	70,920
General merchandise ... net tons	482,501	501,764	984,265	984,265
Passengers ... number	15,853	15,375	31,228	.....
Freight:				
East bound ... net tons	36,847,956	4,736,949	41,584,905	41,584,905
West bound ... do	8,332,336	1,833,839	10,166,175	10,166,175
Total freight ... do	45,180,292	6,570,788	51,751,080	51,751,080
Vessel passages ... number	16,475	5,680	22,155	.....
Registered tonnage ... net	34,789,793	6,308,531	41,098,324	41,098,324

NOTE.—In addition to the above traffic, 13,500 cords of pulp wood and 1,179,000 feet of logs passed down the rapids, bound for lower lake ports.

Monthly registered and freight tonnage, season 1906.

Month.	Net registered tonnage of vessels.			Freight carried.		
	East-bound.	West-bound.	Total	East-bound.	West-bound.	Total.
				Net tons.	*Net tons.*	*Net tons.*
April	894,390	1,112,250	2,006,640	1,765,332	747,935	2,513,267
May	2,293,907	2,341,868	4,635,775	4,621,827	717,451	5,339,278
June	2,823,113	2,859,208	5,682,321	5,725,508	1,299,727	7,025,235
July	3,047,462	2,996,494	6,043,956	6,273,734	1,459,037	7,732,771
August	2,856,437	2,872,325	5,728,762	5,818,146	1,525,581	7,343,727
September	2,862,615	2,763,368	5,625,983	5,865,015	1,385,144	7,250,159
October	2,886,602	2,944,035	5,830,637	5,848,392	1,352,686	7,201,078
November	2,272,027	2,345,199	4,617,226	4,492,733	1,294,587	5,787,320
December	623,855	303,169	927,024	1,174,218	384,027	1,558,245
Total	20,560,408	20,537,916	41,098,324	41,584,905	10,166,175	51,751,080

INTERLAKE TRAFFIC.

Freight between Lake Superior and each of the other lakes.

[Classified with reference to American and Canadian vessels and ports.]

Freight carried by—	Ports.		Eastbound from Lake Superior to—				Total.
	From—	To—	Lake Michigan.	Lake Huron.	Lake Erie.	Lake Ontario.	
American vessels	American	American	4,293,708	129,120	34,965,011	22,358	39,410,192
Do	do	Canadian		39,289	11,550	103,762	154,601
Do	Canadian	American	19,370	35,430	404,696		459,496
Canadian vessels	do	Canadian		840,659	360	404,285	1,245,304
Do	do	American			121,707		121,707
Do	American	Canadian		187,438		6,167	193,605
Total eastbound.			4,313,078	1,231,936	35,503,324	536,567	41,584,905
			Westbound to Lake Superior from—				
			Lake Michigan.	Lake Huron.	Lake Erie.	Lake Ontario.	
American vessels	American	American	67,455	72,812	8,291,955	5,268	8,437,490
Do	do	Canadian	3,877	8,206	766,552	2,625	781,260
Do	Canadian	American				2,188	2,188
Canadian vessels	do	Canadian		349,066	2,677	85,743	437,486
Do	do	American		20,162		2,390	22,552
Do	American	Canadian	42,226	1,870	436,109	4,994	485,199
Total westbound.			113,558	452,116	9,497,293	103,208	10,166,175
Grand total			4,426,636	1,684,052	45,000,617	639,775	51,751,080

AMOUNT PAID FOR CARRYING FREIGHT.

Transportation charges, including loading and unloading, on freight passing through canals at Sault Ste. Marie, Michigan and Ontario, for the season of 1906.

Article.	Quantity.	Rate per unit.	Amount.
Coal ... net tons	8,739,630	$0.35	$3,058,870.50
Flour ... barrels	6,495,350	.18	1,169,163.00
Wheat ... bushels	84,271,358	.022	1,853,969.87
Grain, other than wheat ... do	54,343,155	.022	1,195,549.41
Manufactured iron ... net tons	370,186	2.00	740,372.00
Pig iron ... do	20,919	1.50	31,378.50
Salt ... barrels	468,162	.12	56,179.44
Copper ... net tons	107,633	1.50	161,449.50
Iron ore ... do	35,357,042	.67	23,689,218.14
Lumber ... M feet B. M	900,631	2.70	2,431,703.70
Building stone ... net tons	6,222	1.50	9,333.00
General merchandise ... do	1,134,851	2.00	2,269,702.00
Total			36,666,889.06

VALUE OF TOTAL FREIGHT CARRIED.

Estimated value of total freight passing the canals at Sault Ste. Marie, Michigan and Ontario, for the season of 1906.

Item.	Quantity.	Price per unit.	Valuation.	Per cent of total value.
Coal:				
Anthracite ... net tons	1,011,375	$5.75	$5,815,406	4.68
Bituminous ... do	7,728,255	2.50	19,320,638	
Flour ... barrels	6,495,350	4.20	27,280,470	24.80
Wheat ... bushels	84,271,358	.80	67,417,086	
Grain, other than wheat ... do	54,343,155	.71	38,583,640	
Iron ore ... net tons	35,357,042	3.45	121,981,795	22.69
Manufactured iron ... do	370,186	80.00	29,614,880	5.58
Pig iron ... do	20,919	18.50	387,002	
Copper (refined and matte) ... do	107,633	340.00	36,595,220	6.81
Lumber ... M feet B. M	900,631	22.00	19,813,882	3.69
Salt ... barrels	468,162	.75	351,121	31.75
Silver ore ... net tons	.....	.....	.....	
Building stone ... do	6,222	12.00	74,664	
General merchandise ... do	1,134,851	150.00	170,227,650	
Total	.....	.....	537,463,454	100.00

The value of grain, other than wheat, as given in the above table, is computed as follows:

Article.	Bushels.	Price per unit.	Total value.
Rye	587,650	$0.603	$354,352.95
Oats	20,463,374	.355	7,264,497.77
Corn	775,206	.495	383,726,97
Barley	10,976,929	.443	4,862,779.55
Flax	21,539,996	1.185	25,524,895.26
Total	54,343,155	[a] .71	38,390,252.50

[a] Average.

VESSEL DIMENSIONS.

Classification of registered vessels as to length and beam over all.

NONFREIGHT CARRIERS: TUGS, YACHTS, ETC.

Length.	Beam.	Number of vessels.							
		1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
30 to 100 feet	8 to 29 feet	56	38	69	45	62	83	58	67
100 to 200 feet	12 to 32 feet	6	4	7	5	8	22	4	14
379 feet	45 feet	2	2	0	0	1	1	1	1

FREIGHT CARRIERS.

30 to 100 feet	8 to 28 feet	53	44	16	39	20	6	26	13
100 to 200 feet	21 to 39 feet	283	316	275	243	219	183	194	170
200 to 300 feet	32 to 43 feet	267	285	303	337	314	291	293	258
300 to 400 feet	38 to 50 feet	124	134	152	179	174	181	183	171
400 to 500 feet	45 to 53 feet	41	56	71	87	97	118	128	128
500 to 600 feet	52 to 60 feet	.....	.....	.....	.....	.....	1	23	57
Total	.....	832	879	893	935	895	886	910	879

VESSEL CLASSIFICATION, VALUATION, ETC.

Classification of American and Canadian vessels, showing valuation and registered tonnage, and the freight and passengers carried through the canals at Sault Ste. Marie, Michigan and Ontario, during season of 1906.

AMERICAN VESSELS.

Class.	No.	Valuation.	Tonnage.		Passengers.
			Registered.	Freight (net tons).	
Steamers	597	$82,465,000	1,219,838	43,526,350	26,839
Sailing	170	5,927,000	205,999	5,705,762	.....
Unregistered	.....	.....	.....	13,115	.....
Total	767	88,392,000	1,425,837	49,245,227	26,839

CANADIAN VESSELS.

Steamers	101	$5,780,000	66,414	2,345,701	36,194
Sailing	11	360,500	10,506	74,449	.....
Unregistered	.....	.....	.....	85,703	.....
Total	112	6,140,500	76,920	2,505,853	36,194
Grand total	879	94,532,500	1,502,757	51,751,080	63,033

American vessels carried 95 per cent of the total freight and 43 per cent of the total passengers.

Canadian vessels carried 5 per cent of the total freight and 57 per cent of the total passengers.

Unregistered American craft carried 13,115 net tons of freight in 396 passages, or an average of 33 tons per passage.

Unregistered Canadian craft carried 85,703 net tons of freight in 414 passages, or an average of 207 tons per passage.

Of the 22,155 passages for the season, 3,537 were by 90 vessels under 100 tons register, with an average register of 39 tons. The total freight carried by such craft amounted to 408 net tons.

Average and limiting dimensions of vessels classified by maximum freight cargoes.

Freight tons in largest cargo.	Length.			Beam.			Draft.		
	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Less than 100	145	75	103.8	27	15	21.6	12	4	8.9
100 to 1,000	222	108	168.3	34.3	25.6	30.4	14.8	9	12.5
1,000 to 2,000	320	147	203.6	41.5	28	34.4	18	6	14
2,000 to 3,000	325	214	254.9	46	27	39	19.6	12.3	16.6
3,000 to 4,000	363	250	291.6	45.6	27	41.1	19.8	15.6	18.5
4,000 to 5,000	370	300	331.5	48	39	43.1	19.8	17.6	18.8
5,000 to 6,000	422.6	317.6	371.9	50.5	41	46.4	20	17.7	19.2
6,000 to 7,000	443	356	385.3	51.2	44.2	47.9	20	18.4	19.2
7,000 to 8,000	476	370	429.5	52.2	44.2	50.1	20	18.5	19.4
8,000 to 9,000	498	418.6	458.9	52	45.5	50.9	20	17.8	19.3
9,000 to 10,000	510	468	493.3	53	50	52.2	20	19.1	19.5
10,000 to 11,000	552	482	528.8	56	50	54.3	20	18.5	19.4
11,000 to 12,000	602	533	551.5	60.2	54	55.9	20	19	19.4
12,000 to 13,000	602	545	569.6	60.2	55.2	56.7	20	19.3	19.7
13,000 to 14,000	600	600	600	58	58	58	20.1	19.6	19.8

Average and maximum dimensions of, and percentage of total freight carried by, vessels of different classes.

Class.	Boats of class using canal.	Aggregate registered tonnage.	Average registered tonnage.	Average length.	Maximum length.	Maximum beam.
Tons net register between—	*Number.*	*Tons.*	*Tons.*	*Feet.*	*Feet.*	*Feet.*
1 and 1,000	383	162,022	423	161	258	42
1,000 and 2,000	216	332,599	1,540	269	366	45
2,000 and 3,000	77	200,358	2,602	365	448	51
3,000 and 4,000	127	433,845	3,416	426	484	53
4,000 and 5,000	42	191,213	4,553	500	569	56
5,000 and 6,000	34	182,720	5,374	538	602	60
Unregistered	.....	.....	.....	.....	.....	.....
Total	879	1,502,757	.....	.....	.....	.....

Class.	Passages of vessels of class.	Aggregate freight carried by vessels of class.	Average cargo.	Total freight carried by class.
Tons net register between—	*Number.*	*Net tons.*	*Net tons.*	*Per cent.*
1 and 1,000	7,755	3,124,402	403	6.0
1,000 and 2,000	4,483	9,962,257	2,222	19.3
2,000 and 3,000	2,113	7,400,240	3,502	14.3
3,000 and 4,000	4,128	17,666,011	4,280	34.1
4,000 and 5,000	1,472	7,516,690	5,106	14.5
5,000 and 6,000	1,004	5,982,662	5,959	11.6
Unregistered	1,200	98,818	82	.2
Total	22,155	51,751,080	.....	100.0

Yearly statement of freight carried by steamers and sailing vessels.

Year.	Steamers.		Sailing.		Unregistered craft.		Total freight.	Freight carried by sailing vessels.[a]
	In commission.	Freight carried.	In commission.	Freight carried.	Passages.	Freight carried.		
		Net tons.		*Net tons.*		*Net tons.*	*Net tons.*	*Per cent.*
1888	312	4,292,976	210	2,095,347	219	23,100	6,411,423	33
1889	345	5,175,799	231	2,304,538	443	35,685	7,516,022	31
1890	369	6,291,873	229	2,743,839	447	5,501	9,041,213	30
1891	396	6,420,939	256	2,456,091	447	11,729	8,888,759	28
1892	460	7,960,477	275	3,242,441	227	11,415	11,214,333	30
1893	459	7,723,153	294	3,034,084	213	39,335	10,796,572	28
1894	493	9,795,752	321	3,381,860	172	18,248	13,195,860	26
1895	522	10,581,474	355	4,464,671	232	16,435	15,062,580	30
1896	509	11,878,089	350	4,349,083	210	11,889	16,239,061	27
1897	525	13,163,667	323	5,790,326	377	28,762	18,982,755	31
1898	523	14,569,066	333	6,653,157	286	12,441	21,234,664	31
1899	542	17,801,213	290	7,423,311	366	31,286	25,255,810	29
1900	569	19,586,750	310	5,999,184	454	57,139	25,643,073	23
1901	598	21,186,571	295	7,166,694	413	49,800	28,403,065	25
1902	656	28,465,068	279	7,431,230	490	64,848	35,961,146	21
1903	652	28,042,546	243	6,594,304	361	37,587	34,674,437	19
1904	652	25,720,437	234	5,769,060	513	56,609	31,546,106	18
1905	692	37,724,522	218	6,479,506	729	66,652	44,270,680	15
1906	698	45,872,051	181	5,780,211	810	98,818	51,751,080	11

[a] Sailing vessels include schooners, tow barges, and unrigged craft.

Table showing yearly change in class of freighters as listed from their maximum freight cargoes.

STEAMERS.

Year.	Net tons in maximum cargo between—											Total.
	1 and 1,000.	1,000 and 2,000.	2,000 and 3,000.	3,000 and 4,000.	4,000 and 5,000.	5,000 and 6,000.	6,000 and 7,000.	7,000 and 8,000.	8,000 and 10,000.	10,000 and 12,000.	12,000 and 14,000.	
1900	183	113	87	110	14	18	20	19	5	.....	.....	569
1901	164	118	88	124	17	26	26	31	4	.....	.....	598
1902	180	115	84	133	27	32	37	43	5	.....	.....	656
1903	173	104	71	136	24	37	42	52	13	.....	.....	652
1904	183	78	73	131	26	26	45	56	33	1	.....	652
1905	164	96	80	130	31	19	40	55	57	17	3	692
1906	161	95	70	121	29	19	35	78	42	36	12	698

SAILING VESSELS.

1900	92	134	30	15	9	18	5	4	3	.....	.....	310
1901	86	117	24	25	13	15	7	2	6	.....	.....	295
1902	56	126	28	26	11	7	17	2	6	.....	.....	279
1903	39	115	18	26	12	4	21	2	6	.....	.....	243
1904	45	103	20	23	11	4	19	3	6	.....	.....	234
1905	39	94	21	18	13	3	17	5	8	.....	.....	218
1906	30	82	16	13	8	5	17	4	6	.....	.....	181

STEAMERS AND SAILING VESSELS COMBINED.

1893	264	320	154	15	.....	.....	.....	.....	.....	.....	.....	753
1894	265	339	192	18	.....	.....	.....	.....	.....	.....	.....	814
1895	279	400	176	18	4	.....	.....	.....	.....	.....	.....	877
1896	281	335	168	43	21	11	.....	.....	.....	.....	.....	859
1897	262	280	133	111	26	28	8	.....	.....	.....	.....	848
1898	273	266	116	118	26	34	18	5	.....	.....	.....	856
1899	243	245	109	139	22	32	27	10	5	.....	.....	832
1900	275	247	117	125	23	36	25	23	8	.....	.....	879
1901	250	235	112	149	30	41	33	33	10	.....	.....	893
1902	236	241	112	159	38	39	54	45	11	.....	.....	935
1903	172	259	89	162	36	41	63	54	19	.....	.....	895
1904	228	181	93	154	37	30	64	59	39	1	.....	886
1905	203	190	101	148	44	22	57	60	65	17	3	910
1906	191	177	86	134	37	24	52	82	48	36	12	879

Forty-four new vessels were put in commission for the Lake Superior trade in 1906. They were all steamships for freight traffic. Thirty-two of these new vessels are 500 feet or more in length and carry from 9,000 to 14,000 net tons of freight in a single cargo.

Yearly individual maximum records.

STEAMERS.

Year.	Largest single cargo.	Greatest amount of freight carried.	Greatest number of miles run.	Greatest number of mile-tons.
	Tons.	*Tons.*		
1900	8,462	195,550	45,318	154,554,378
1901	8,222	161,375	41,370	132,822,226
1902	8,441	183,270	45,340	158,858,138
1903	8,914	164,763	45,330	158,843,973
1904	11,536	177,729	33,516	156,410,487
1905	12,368	274,401	41,374	249,038,482
1906	13,272	313,434	42,986	249,353,656

Yearly individual maximum records—Continued.

SAILING VESSELS.

Year.	Largest single cargo.	Greatest amount of freight carried.	Greatest number of miles run.	Greatest number of mile-tons.
1900	8,206	149,031	30,947	124,399,966
1901	8,288	125,401	26,424	99,419,012
1902	8,485	150,258	32,033	119,437,488
1903	8,671	128,201	26,569	114,536,002
1904	8,736	117,365	24,158	106,643,498
1905	9,184	155,772	31,481	127,243,648
1906	8,960	141,770	31,575	126,745,992

Names of vessels making above maximum records

STEAMERS.

Year.	Largest single cargo.	Greatest amount of freight carried.	Greatest number of miles run.	Greatest number of mile-tons.
1900	John W. Gates	Presque Isle	Troy	John W. Gates.
1901	Wm. Edenborn	do	Buffalo	John J. Albright.
1902	I. L. Elwood	Wm. Edenborn	Troy	Wm. Edenborn.
1903	Wm. Edenborn	John W. Gates	Buffalo	Bransford.
1904	Aug. B. Wolvin	Aug. B. Wolvin	Huronic	Aug. B. Wolvin.
1905	E. H. Gary	do	Duluth	Do.
1906	J. P. Morgan	E. H. Gary	E. H. Gary	E. H. Gary.

SAILING VESSELS.

1900	Madeira	Madeira	Madeira	Madeira.
1901	Manila	Marsala	Sir I. L. Bell	Do.
1902	John Smeaton	John Fritz	Alex. Holley	Marsala.
1903	Manila	Alex. Maitland	Barge No. 105	Alex. Maitland.
1904	John Smeaton	do	Maida	Do.
1905	do	Manila	Marcia	John Smeaton.
1906	do	Alex. Maitland	W. LeB. Jenney	Constitution.

The maximum freight traffic for a single day was on June 25, when 371,005 tons passed through the canals. The vessel passages on this day numbered 122, the aggregate registered tonnage being 244,804.

There were no passages on December 20 and 21.

DELAYS.

The American canal records show that vessels necessarily spent 26,759 hours and 25 minutes in canal, or an average of 1 hour 48 minutes and 22 seconds, which includes time waiting for lockage and passage through locks and canal, the latter being $1\frac{3}{8}$ miles long.

Other delays at canal, which included taking on supplies, waiting for daylight or favorable weather, amounted to 10,901 hours and 20 minutes.

Delays to vessels due to operating railway swing bridge amounted to 4 hours and 19 minutes.

Trains were delayed 50 hours and 26 minutes by passing boats temporarily preventing the closing of bridge.

The aggregate time the railway swing bridge was swung across the canal amounted to 948 hours and 46 minutes, during which time 3,904 engines, 5,811 passenger cars, and 33,505 freight cars crossed the bridge.

COMPARATIVE TRAFFIC—YEARS 1905 AND 1906.

Lake commerce through the canals at Sault Ste. Marie, Michigan and Ontario, for the seasons of 1905 and 1906.

Items.	Traffic for 1906.		Total traffic for—		Change.	
	United States canal.	Canadian canal.	Season 1906.	Season 1905.	Amount.	Per cent.
Vessel passages:						
Steamers.....number..	13,051	5,087	18,138	17,197	941	+ 5
Sailing .....do....	2,607	210	2,817	3,263	446	− 14
Unregistered .....do....	817	383	1,200	1,219	19	− 2
Total .....do....	16,475	5,680	22,155	21,679	476	+ 2
Lockages .....do....	10,367	4,156	14,523	13,792	731	+ 5
Tonnage:						
Registered.....net..	34,789,793	6,308,531	41,098,324	36,617,699	4,480,625	+ 12
Freight.....do....	45,180,292	6,570,788	51,751,080	44,270,680	7,480,400	+ 17
Passengers.....number..	30,925	32,108	63,033	54,204	8,829	+ 16
Coal:						
Hard .....net tons..	872,383	138,992	1,011,375	984,701	26,674	+ 3
Soft.....do....	6,634,006	1,094,249	7,728,255	5,524,355	2,203,900	+ 40
Flour .....barrels..	4,100,024	2,395,326	6,495,350	5,772,719	722,631	+ 13
Wheat.....bushels..	49,977,831	34,293,527	84,271,358	68,321,288	15,950,070	+ 23
Grain, other than wheat ....do....	37,661,898	16,681,257	54,343,155	39,229,553	15,113,602	+ 39
Manufactured and pig iron, net tons.....	304,321	86,784	391,105	237,696	153,409	+ 65
Salt .....barrels..	371,680	96,482	468,162	423,122	45,040	+ 11
Copper.....net tons..	99,572	8,061	107,633	106,520	1,113	+ 1
Iron ore .....do....	32,453,645	2,903,397	35,357,042	31,332,637	4,024,405	+ 13
Lumber ..... M feet B. M..	854,167	46,464	900,631	966,806	66,175	− 7
Silver ore.....net tons..	.....	.....	.....	41	41	−100
Building stone .....do....	6,222	.....	6,222	10,899	4,677	− 43
General merchandise.....do....	541,895	592,956	1,134,851	836,583	298,268	+ 36

YEARLY SUMMARIES SINCE 1887.

Total freight, its valuation, freight charges, average haul or distance freight was carried, and rate per ton per mile.

Year.	Total freight.	Valuation of freight.	Freight charges.	Average haul.	Freight charges per mile-ton.	Value of American craft.	Value of Canadian craft.
	Net tons.			*Miles.*	*Mills.*		
1887.....	5,494,649	$79,031,757	$10,075,153	811.4	2.3	$17,684,550	$2,089,400
1888.....	6,411,423	82,156,019	7,883,077	806.4	1.5	20,381,100	1,514,300
1889.....	7,516,022	83,732,527	8,634,246	790.4	1.5	25,328,600	1,597,600
1890.....	9,041,213	102,214,948	9,472,214	797.2	1.3	27,857,700	1,777,800
1891.....	8,888,759	128,178,208	9,849,022	820.4	1.35	31,947,300	2,119,500
1892.....	11,214,333	135,117,267	12,072,850	822.4	1.31	36,220,100	2,108,700
1893.....	10,796,572	145,436,957	9,957,483	831.9	1.1	39,017,400	2,115,700
1894.....	13,195,860	143,114,502	10,798,310	821.1	.99	41,124,200	1,959,800
1895.....	15,062,580	159,575,129	14,238,758	830.0	1.14	40,858,800	2,037,000
1896.....	16,239,061	195,146,842	13,511,615	836.4	.99	43,006,200	2,135,300
1897.....	18,982,755	218,235,927	13,220,099	841.3	.83	42,375,700	2,001,400
1898.....	21,234,664	233,069,740	14,125,896	842.6	.79	45,199,800	2,491,900
1899.....	25,255,810	281,364,750	21,959,707	827.2	1.05	65,000,520	3,369,600
1900.....	25,643,073	267,041,959	24,953,314	825.9	1.18	66,116,583	3,618,576
1901.....	28,403,065	289,906,865	23,217,974	823.3	.99	57,244,200	3,311,900
1902.....	35,961,146	358,306,300	26,566,189	827.4	.89	67,205,000	3,792,400
1903.....	34,674,437	349,405,014	26,727,735	835.6	.92	68,252,800	6,384,500
1904.....	31,546,106	334,502,686	21,552,894	843.5	.81	63,789,300	5,377,100
1905.....	44,270,680	416,965,484	31,420,585	833.3	.85	73,211,300	5,429,000
1906.....	51,751,080	537,463,454	36,666,889	842.4	.84	88,392,000	6,140,500

Freight rates for water transportation to and from Lake Superior.

Year.	Coal per net ton.	Flour per barrel.	Wheat per bushel.	Grain (other than wheat) per bushel.	Manufactured iron per net ton.	Pig iron per net ton.	Salt per barrel.
1887	$0.90	$0.29	$0.07	$0.07	$2.35	$2.35	$0.18
1888	.70	.175	035	.043	1.80	1.30	.16
1889	.47	.18	.04	.033	2.10	1.45	.18
1890	.45	.13	.03	.02	1.34	1.35	.15
1891	.43	.15	.046	.035	2.50	1.17	.18
1892	.41	.165	.036	.038	2.15	1.23	.15
1893	.40	.17	.028	.028	2.00	1.30	.12
1894	.40	.14	.025	.028	.90	1.15	.12
1895	.37	.14	.044	.045	1.50	1.05	.13
1896	.32	.11	.025	.023	1.40	1.05	.15
1897	.30	.10	.017	.02	1.40	1.05	.15
1898	.25	.10	.02	.02	1.40	1.05	.15
1899	.46	.13	.036	.036	1.70	1.50	.15
1900	.44	.12	.02	.02	2.00	1.50	.15
1901	.38	.12	.023	.022	2.00	1.50	.15
1902	.45	.12	.019	.019	2.00	1.50	.15
1903	.53	.12	.016	.016	2.00	1.50	.15
1904	.40	.13	.018	.018	2.00	1.50	.10
1905	.33	.14	.023	.023	2.00	1.50	.10
1906	.35	.18	.022	.022	2.00	1.50	.12

Year.	Copper per net ton.	Iron ore per net ton.	Lumber per M feet B. M.	Silver ore per net ton.	Building stone per net ton.	General merchandise per net ton.
1887	$2.60	$1.75	$4.00	$3.00	$1.15	$4.00
1888	2.35	1.28	2.80	1.90	2.05	3.00
1889	2.25	1.14	2.70	1.90	2.02	3.00
1890	2.38	1.10	2.38	2.25	2.00	2.75
1891	2.00	.98	2.70	2.25	2.00	3.58
1892	1.40	1.00	2.95	2.25	1.67	3.60
1893	1.75	.80	2.35	2.25	1.36	3.00
1894	1.95	.70	1.90	2.25	1.28	2.75
1895	1.66	.82	2.00	2.33	1.20	2.50
1896	1.95	.82	1.80	2.33	1.50	2.30
1897	1.95	.65	1.55	2.33	1 50	2.30
1898	2.00	.60	1.65	.....	1.50	2.40
1899	2.00	.70	3.00	2.50	2.00	2.50
1900	1.60	1.05	2.30	2.00	1.50	2.00
1901	1.65	.78	2.55	.....	1.50	2.25
1902	1.40	.68	2.45	2.00	1.50	2.00
1903	1.43	.75	2.50	.....	1.50	2.00
1904	1.45	.63	2.55	2.00	1.50	2.00
1905	1.25	.68	2.45	2.00	1.50	2.00
1906	1.50	.67	2.70	.....	1.50	2.00

Total freight valuations since 1887.

Year.	Coal (hard and soft).	Flour.	Wheat.	Grain (other than wheat.)	Manufactured iron.	Pig iron.	Salt.
1887	$4,735,454	$7,863,675	$22,634,590	$759,653	$3,035,750	$241,468	$204,908
1888	7,367,644	10,953,625	18,224,424	1,981,862	2,442,950	252,348	210,433
1889	5,702,190	11,143,535	15,907,217	2,090,580	1,577,250	442,272	168,250
1890	7,619,238	16,195,520	15,893,022	2,003,496	4,680,750	386,104	179,431
1891	8,776,362	18,900,715	38,040,239	1,011,462	2,128,000	462,077	234,528
1892	10,164,931	21,672,540	30,746,085	933,346	2,988,600	709,716	275,740
1893	10,528,420	29,682,696	32,611,239	1,346,993	2,852,300	550,902	228,730
1894	8,191,917	33,621,649	22,316,469	772,504	1,805,350	331,452	237,461
1895	6,993,351	33,383,632	30,041,863	4,164,347	3,683,150	346,788	202,439
1896	8,452,073	34,199,003	47,442,347	10,704,748	4,696,200	377,298	178,136
1897	9,456,824	40,145,144	48,654,143	11,449,256	6,092,400	176,437	214,086
1898	10,334,461	33,056,683	49,871,997	13,039,192	10,709,350	476,775	226,170
1899	12,854,278	25,610,929	43,798,001	17,700,552	19,111,000	457,762	237,252
1900	14,620,840	27,042,752	28,342,511	14,071,953	11,551,000	351,313	328,895
1901	15,492,226	24,811,637	36,440,719	22,779,703	17,609,800	485,520	332,830
1902	16,570,398	31,185,840	55,246,295	25,521,556	20,323,380	277,925	288,149
1903	24,898,407	31,920,210	49,107,642	22,787,909	18,385,950	522,440	318,417
1904	19,657,221	25,907,959	52,425,313	23,121,694	18,512,600	672,885	255,821
1905	20,706,302	30,018,139	61,489,159	25,891,505	18,195,100	872,409	296,185
1906	25,136,044	27,280,470	67,417,086	38,583,640	29,614,880	387,002	351,121

Total freight valuations since 1887—Continued.

Year.	Copper.	Iron ore.	Lumber.	Silver ore and bullion.	Building stone.	General merchandise.	Total.
1887	$6,977,200	$8,741,995	$2,974,068	$53,826	$134,010	$20,675,160	$79,031,757
1888	5,792,000	8,996,808	4,326,696	520,579	335,410	20,751,240	82,156,019
1889	6,691,200	14,335,492	5,679,972	914,589	335,380	18,744,600	83,732,527
1890	8,745,800	16,711,688	6,514,722	527,807	479,730	22,277,640	102,214,948
1891	13,838,000	12,460,744	6,593,490	266,211	440,800	25,025,580	128,178,208
1892	12,998,600	17,153,962	9,231,192	296,815	396,980	27,548,760	135,117,267
1893	17,506,000	14,050,946	10,593,810	379,861	194,260	24,910,800	145,436,957
1894	19,914,600	17,027,078	11,564,608	46,144	214,170	27,071,100	143,114,502
1895	21,490,400	22,332,319	8,888,400	11,200	238,760	27,798,480	159,575,129
1896	23,374,400	25,705,062	8,562,325	26,880	177,310	31,251,060	195,146,842
1897	24,464,800	31,901,145	10,875,762	560	62,490	34,742,880	218,235,927
1898	29,814,240	35,120,880	12,984,532	.....	46,700	37,388,760	233,069,740
1899	38,428,800	52,116,016	17,646,969	60,875	468,756	52,873,560	281,364,750
1900	39,319,800	61,663,380	15,009,241	13,750	586,824	54,139,700	267,041,959
1901	26,227,866	58,794,509	16,617,922	.....	559,008	69,755,125	298,906,865
1902	22,916,280	75,260,420	17,736,404	125	467,028	92,512,500	358,306,300
1903	25,961,710	74,709,398	18,057,456	.....	255,600	82,479,875	349,405,014
1904	26,305,200	52,034,862	16,388,220	74,580	325,116	98,821,215	334,502,686
1905	30,358,200	93,997,911	17,885,911	2,255	130,788	117,121,620	416,965,484
1906	36,595,220	121,981,795	19,813,882	.....	74,664	170,227,650	537,463,454

Unit freight valuations since 1887.

Year.	Anthracite coal, per net ton.	Bituminous coal, per net ton.	Flour, per barrel.	Wheat, per bushel.	Grain (other than wheat), per bushel.	Manufactured iron, per net ton.	Pig iron, per net ton.
1887	[a] $3.50	[a] $3.50	$5.00	$0.98	$0.98	$50.00	$17.00
1888	[a] 3.50	[a] 3.50	5.00	.98	.98	50.00	17.00
1889	[a] 3.50	[a] 3.50	5.00	.98	.98	50.00	17.00
1890	[a] 3.50	[a] 3.50	5.00	.98	.98	50.00	17.00
1891	[a] 3.50	[a] 3.50	5.00	.98	.98	50.00	17.00
1892	[a] 3.50	[a] 3.50	4.00	.75	.56	50.00	17.00
1893	[a] 3.50	[a] 3.50	4.00	.75	.56	50.00	17.00
1894	[a] 2.93	[a] 2.93	3.75	.64	.50	50.00	13.50
1895	4.25	2.40	3.75	.65	.50	50.00	13.00
1896	4.75	2.50	3.85	.75	.39	50.00	13.50
1897	5.50	2.60	4.50	.87	.46	50.00	13.25
1898	4.75	2.40	4.25	.80	.50	50.00	13.25
1899	5.70	2.60	3.60	.75	.59	100.00	19.50
1900	5.25	3.00	4.00	.70	.87	100.00	17.50
1901	5.60	2.90	3.25	.69	.92	100.00	16.00
1902	6.25	3.25	3.50	.72	.92	110.00	20.75
1903	5.80	3.15	4.50	.80	.71	110.00	20.00
1904	5.50	2.60	5.50	1.05	.70	100.00	15.00
1905	5.60	2.75	5.20	.90	.66	100.00	15.65
1906	5.75	2.50	4.20	.80	.71	80.00	18.50

Year.	Salt, per barrel.	Copper, per net ton.	Iron ore, per net ton.	Lumber, per M feet.	Silver ore, per net ton.	Building stone, per net ton.	General merchandise, per net ton.
1887	$1.00	$200.00	$3.50	$18.00	$153.79	$10.00	$60.00
1888	1.00	200.00	3.50	18.00	153.79	10.00	60.00
1889	1.00	200.00	3.50	18.00	153.79	10.00	60.00
1890	1.00	200.00	3.50	18.00	153.79	10.00	60.00
1891	1.00	200.00	3.50	18.00	153.79	10.00	60.00
1892	1.00	200.00	3.50	18.00	153.79	10.00	60.00
1893	1.00	200.00	3.50	18.00	153.79	10.00	60.00
1894	1.00	200.00	2.60	16.00	112.00	10.00	60.00
1895	.75	200.00	2.77	12.00	112.00	10.00	60.00
1896	.75	200.00	3.25	12.50	112.00	10.00	60.00
1897	.75	200.00	3.00	13.50	112.00	10.00	60.00
1898	.75	240.00	3.00	14.50	.....	10.00	60.00
1899	.75	320.00	3.40	17.00	125.00	12.00	90.00
1900	1.00	300.00	3.75	16.50	125.00	12.00	100.00
1901	.75	266.00	3.25	15.50	.....	12.00	125.00
1902	.65	190.00	3.10	16.25	125.00	12.00	125.00
1903	.70	230.00	3.45	18.00	.....	12.00	125.00
1904	.70	240.00	2.65	17.75	55.00	12.00	135.00
1905	.70	285.00	3.00	18.50	55.00	12.00	140.00
1906	.75	340.00	3.45	22.00	.....	12.00	150.00

[a] Average price for anthracite and bituminous coal combined.

Statement of commerce through both American and Canadian canals at Sault Ste. Marie, Michigan and Ontario, for each year from first opening in 1855.

Season.			Class and tonnage of vessels.				
			Passages by—				
Year.	Date of opening canal.	Date of closing canal.	Steamers.	Sailing vessels.	Unregistered craft.	Total passages.	Net registered tonnage.
1855	June 18	Nov. 23	149	44	.....	193	106,296
1856	May 4	Nov. 28	178	112	.....	290	101,458
1857	May 9	Nov. 30	184	192	.....	376	180,820
1858	Apr. 18	Nov. 20	224	182	.....	406	219,819
1859	May 3	Nov. 28	258	411	.....	669	352,642
1860	May 11	Nov. 26	337	579	.....	916	403,657
1861	May 3	Nov. 14	296	242	.....	538	276,639
1862	Apr. 27	Nov. 27	295	543	.....	838	359,612
1863	Apr. 28	Nov. 24	305	952	.....	1,257	507,434
1864	May 2	Dec. 4	366	1,045	.....	1,411	571,438
1865	May 1	Dec. 3	395	602	.....	997	409,062
1866	May 5	Dec. 3	453	555	.....	1,008	458,530
1867	May 4	Dec. 3	466	839	.....	1,305	556,899
1868	May 2	Dec. 3	338	817	.....	1,155	432,563
1869	May 4	Nov. 29	399	939	.....	1,338	524,885
1870	Apr. 29	Dec. 1	431	1,397	.....	1,828	690,826
1871	May 8	Nov. 29	573	1,064	.....	1,637	752,101
1872	May 11	Nov. 26	792	1,212	.....	2,004	914,735
1873	May 5	Nov. 18	968	1,519	.....	2,517	1,204,446
1874	May 12	Dec. 2	901	833	.....	1,734	1,070,857
1875	May 12	Dec. 2	1,464	569	.....	2,033	1,259,534
1876	May 8	Nov. 26	1,733	684	.....	2,417	1,541,676
1877	May 2	Nov. 30	1,050	1,401	.....	2,451	1,439,216
1878	Apr. 8	Dec. 3	1,476	1,091	.....	2,567	1,667,136
1879	May 2	Dec. 3	1,618	1,403	100	3,121	1,677,071
1880	Apr. 28	Nov. 15	1,735	1,718	50	3,503	1,734,890
1881	May 7	Dec. 5	2,117	1,706	181	4,004	2,092,757
1882	Apr. 21	Dec. 3	2,739	1,663	372	4,774	2,468,088
1883	May 2	Dec. 11	2,620	1,458	237	4,315	2,042,259
1884	Apr. 23	Dec. 10	3,609	1,709	371	5,689	2,997,837
1885	May 6	Dec. 2	3,354	1,689	337	5,380	3,035,937
1886	Apr. 25	Dec. 4	4,584	2,534	306	7,424	4,219,397
1887	May 1	Dec. 2	5,968	2,562	825	9,355	4,897,598
1888	May 7	Dec. 4	5,305	2,009	489	7,803	5,130,659
1889	Apr. 15	Dec. 4	6,501	2,635	443	9,579	7,221,935
1890	Apr. 20	Dec. 3	7,268	2,872	417	10,557	8,454,435
1891	Apr. 27	Dec. 7	7,339	2,405	447	10,191	8,400,685
1892	Apr. 18	Dec. 6	8,737	3,324	519	12,580	10,647,203
1893	May 1	Dec. 5	8,379	2,955	674	12,008	8,949,754
1894	Apr. 17	Dec. 6	10,208	3,676	607	14,491	13,110,366
1895	Apr. 25	Dec. 11	12,495	4,790	671	17,956	16,806,781
1896	Apr. 21	Dec. 8	13,404	4,391	820	18,615	17,249,418
1897	Apr. 21	Dec. 14	12,029	4,438	704	17,171	17,619,983
1898	Apr. 11	Dec. 14	12,461	4,449	851	17,761	18,622,754
1899	Apr. 26	Dec. 20	14,378	4,776	1,101	20,255	21,958,347
1900	Apr. 19	Dec. 16	14,426	4,004	1,022	19,452	22,315,834
1901	Apr. 20	Dec. 21	14,372	4,482	1,187	20,041	24,626,976
1902	Apr. 1	Dec. 20	17,069	4,368	1,222	22,659	31,955,582
1903	Apr. 2	Dec. 15	14,027	3,569	1,000	18,596	27,736,444
1904	Apr. 30	Dec. 26	12,188	2,994	938	16,120	24,364,138
1905	Apr. 10	Dec. 20	17,197	3,263	1,219	21,679	36,617,699
1906	Apr. 13	Dec. 22	18,138	2,817	1,200	22,155	41,098,324

***Statement of commerce through both American and Canadian canals at Sault Ste. Marie, Michigan and Ontario, etc.*—Continued.**

Season.			Passengers.	Freight traffic.					
Year.	Date of opening canal.	Date of closing canal.		Coal.	Flour.	Wheat.	Grain, other than wheat.	Manufactured and pig iron.	Salt.
				Net tons.	*Barrels.*	*Bushels.*	*Bushels.*	*Net tons.*	*Barrels.*
1855.....	June 18	Nov. 23	8,295	1,414	10,289	.....	.....	1,445	196
1856.....	May 4	Nov. 28	7,992	3,968	17,686	.....	82,060	2,272	1,027
1857.....	May 9	Nov. 30	6,650	5,298	18,515	.....	40,637	4,426	1,118
1858.....	Apr. 18	Nov. 20	9,230	4,118	13,782	.....	21,000	3,031	1,223
1859.....	May 3	Nov. 28	.....	8,884	39,459	74	71,738	7,172	2,737
1860.....	May 11	Nov. 26	.....	.....	50,250	.....	133,437	1,446	.....
1861.....	May 3	Nov. 14	8,816	11,507	22,743	223	76,830	4,904	3,014
1862.....	Apr. 27	Nov. 27	8,468	11,346	17,291	.....	59,062	7,023	2,477
1863.....	Apr. 28	Nov. 24	18,281	7,805	31,975	.....	78,480	7,939	1,506
1864.....	May 2	Dec. 4	16,985	11,282	33,937	.....	143,560	9,234	1,776
1865.....	May 1	Dec. 3	19,777	.....	34,985	.....	.....	7,400	3,175
1866.....	May 5	Dec. 3	14,067	19,915	33,603	.....	229,926	14,484	4,454
1867.....	May 4	Dec. 3	15,120	22,927	28,345	.....	249,031	23,141	5,316
1868.....	May 2	Dec. 3	10,590	25,814	27,372	.....	285,123	23,991	4,624
1869.....	May 4	Nov. 29	17,657	27,850	32,007	.....	323,501	25,604	5,910
1870.....	Apr. 29	Dec. 1	17,153	15,952	33,548	49,700	304,077	42,049	11,089
1871.....	May 8	Nov. 29	15,859	46,798	26,040	1,376,705	308,823	57,216	36,199
1872.....	May 11	Nov. 26	25,830	80,815	136,411	567,134	445,774	100,293	42,690
1873.....	May 5	Nov. 18	30,966	96,780	172,692	2,119,997	309,645	47,996	29,335
1874.....	May 12	Dec. 2	22,958	61,124	179,855	1,120,015	149,999	33,713	44,231
1875.....	May 12	Dec. 2	19,685	101,260	309,991	1,213,788	272,580	56,649	43,989
1876.....	May 8	Nov. 26	20,286	124,960	390,577	1,971,549	424,468	67,409	46,666
1877.....	May 2	Nov. 30	21,800	91,575	355,117	1,349,738	378,063	42,705	63,188
1878.....	Apr. 8	Dec. 3	20,394	91,856	344,599	1,872,940	264,674	18,116	63,520
1879.....	May 2	Dec. 3	18,979	110,704	451,154	2,603,666	973,948	43,771	92,245
1880.....	Apr. 28	Nov. 15	25,766	170,501	523,860	2,105,920	2,553,436	54,302	77,916
1881.....	May 7	Dec. 5	24,671	295,647	605,453	3,456,965	367,838	87,830	65,897
1882.....	Apr. 21	Dec. 3	29,256	430,184	344,044	3,728,856	473,129	92,870	176,612
1883.....	May 2	Dec. 11	39,130	714,444	687,031	5,900,473	776,552	109,910	70,898
1884.....	Apr. 23	Dec. 10	54,214	706,379	1,248,243	11,985,791	517,103	72,428	144,804
1885.....	May 6	Dec. 2	36,147	894,991	1,440,093	15,274,213	422,981	60,842	136,355
1886.....	Apr. 25	Dec. 4	27,088	1,009,999	1,759,365	18,991,485	715,373	115,208	158,677
1887.....	May 1	Dec. 2	32,668	1,352,987	1,572,735	23,096,520	775,166	74,919	204,908
1888.....	May 7	Dec. 4	25,558	2,105,041	2,190,725	18,596,351	2,022,308	63,703	210,433
1889.....	Apr. 15	Dec. 4	25,712	1,629,197	2,228,707	16,231,854	2,133,245	57,561	168,250
1890.....	Apr. 20	Dec. 3	24,856	2,176,925	3,239,104	16,217,370	2,044,384	116,327	179,481
1891.....	Apr. 27	Dec. 7	26,190	2,507,532	3,780,143	38,816,570	1,032,104	69,741	234,528
1892.....	Apr. 18	Dec. 6	25,896	2,904,266	5,418,135	40,994,780	1,666,690	101,520	275,740
1893.....	May 1	Dec. 5	18,869	3,008,120	7,420,674	43,481,652	2,405,344	89,452	228,730
1894.....	Apr. 17	Dec. 6	27,236	2,797,184	8,965,773	34,869,483	1,545,008	60,659	237,461
1895.....	Apr. 25	Dec. 11	31,656	2,574,362	8,902,302	46,218,250	8,328,694	100,337	269,919
1896.....	Apr. 21	Dec. 8	37,066	3,023,340	8,882,858	63,256,463	27,448,071	121,872	237,515
1897.....	Apr. 21	Dec. 14	40,213	3,039,172	8,921,143	55,924,302	24,889,688	135,164	285,449
1898.....	Apr. 11	Dec. 14	43,426	3,776,450	7,778,043	62,339,996	26,078,384	250,170	301,560
1899.....	Apr. 26	Dec. 20	49,082	3,940,887	7,114,147	58,397,335	30,000,935	214,585	316,336
1900.....	Apr. 19	Dec. 16	58,555	4,486,977	6,760,688	40,489,302	16,174,659	135,585	328,895
1901.....	Apr. 20	Dec. 21	59,663	4,593,136	7,634,350	52,812,636	24,760,547	206,443	443,774
1902.....	Apr. 1	Dec. 20	59,377	4,812,478	8,910,240	76,730,965	27,740,822	198,152	443,306
1903.....	Apr. 2	Dec. 15	55,175	6,937,633	7,093,380	61,384,552	32,095,646	193,267	454,882
1904.....	Apr. 30	Dec. 26	37,695	6,454,869	4,710,538	49,928,869	33,030,992	229,985	365,459
1905.....	Apr. 10	Dec. 20	54,204	6,509,056	5,772,719	68,321,288	39,229,553	237,696	423,122
1906.....	Apr. 13	Dec. 22	63,033	8,739,630	6,495,350	84,271,358	54,343,155	391,105	468,162

***Statement of commerce through both American and Canadian canals at Sault Ste. Marie, Michigan and Ontario, etc.*—Continued.**

Season.			Freight traffic.						
Year.	Date of opening canal.	Date of closing canal.	Copper.	Iron ore.	Lumber.	Silver ore and bullion.	Building stone.	General merchandise.	Total freight.
			Net tons.	*Net tons.*	*M ft. B. M.*	*Net tons.*	*Net tons.*	*Net tons.*	*Net tons.*
1855	June 18	Nov. 23	3,196	1,447	127	.....	.....	5,690	14,503
1856	May 4	Nov. 28	5,977	11,597	433	.....	.....	5,538	33,817
1857	May 9	Nov. 30	4,400	26,185	680	.....	.....	7,140	51,607
1858	Apr. 18	Nov. 20	6,944	31,035	188	.....	.....	9,587	57,002
1859	May 3	Nov. 28	7,269	65,769	766	.....	.....	25,280	122,056
1860	May 11	Nov. 26	9,000	120,000	.....	.....	.....	14,915	153,721
1861	May 3	Nov. 14	7,645	44,837	664	.....	.....	12,972	87,847
1862	Apr. 27	Nov. 27	6,881	113,014	240	.....	.....	19,355	161,675
1863	Apr. 28	Nov. 24	1,044	181,567	1,414	.....	.....	30,213	236,780
1864	May 2	Dec. 4	5,331	213,753	2,012	.....	.....	33,477	284,350
1865	May 1	Dec. 3	9,935	147,459	822	.....	.....	11,226	181,638
1866	May 5	Dec. 3	9,550	152,102	660	.....	.....	32,310	239,457
1867	May 4	Dec. 3	10,585	222,861	1,177	.....	.....	33,632	325,357
1868	May 2	Dec. 3	12,222	191,939	1,404	.....	.....	31,843	299,175
1869	May 4	Nov. 29	18,662	239,368	1,423	.....	.....	41,813	368,326
1870	Apr. 29	Dec. 1	11,301	409,850	814	92	4,560	40,342	539,883
1871	May 8	Nov. 29	14,562	327,461	1,098	464	5,528	74,227	585,583
1872	May 11	Nov. 26	14,986	383,105	1,853	306	5,213	109,663	746,258
1873	May 5	Nov. 18	15,947	504,121	2,191	580	2,218	123,398	888,432
1874	May 12	Dec. 2	15,345	427,658	686	443	401	55,312	655,138
1875	May 12	Dec. 2	18,396	493,408	4,498	847	2,978	70,128	833,465
1876	May 8	Nov. 26	25,756	609,752	17,820	985	2,102	91,119	1,073,570
1877	May 2	Nov. 30	16,767	568,082	15,373	1,020	2,506	64,201	912,639
1878	Apr. 8	Dec. 3	22,529	555,750	34,889	768	2,754	69,007	937,351
1879	May 2	Dec. 3	22,309	540,075	43,439	324	2,226	81,279	1,050,784
1880	Apr. 28	Nov. 15	21,753	677,073	48,635	66	2,283	100,849	1,321,906
1881	May 7	Dec. 5	29,488	748,131	58,877	.....	1,400	129,031	1,567,741
1882	Apr. 21	Dec. 3	25,409	987,060	82,783	22	5,428	172,167	2,029,521
1883	May 2	Dec. 11	31,024	791,732	87,131	814	2,405	191,571	2,267,105
1884	Apr. 23	Dec. 10	36,062	1,136,071	122,389	9,731	6,047	207,173	2,874,557
1885	May 6	Dec. 2	31,927	1,235,122	127,984	3,669	8,189	184,963	3,256,628
1886	Apr. 25	Dec. 4	38,627	2,087,809	138,688	2,009	9,449	230,726	4,527,759
1887	May 1	Dec. 2	34,886	2,497,713	165,226	350	13,401	344,586	5,494,649
1888	May 7	Dec. 4	28,960	2,570,517	240,372	3,385	33,541	345,854	6,411,423
1889	Apr. 15	Dec. 4	33,456	4,095,855	315,554	5,947	33,538	312,410	7,516,022
1890	Apr. 20	Dec. 3	43,729	4,774,768	361,929	3,432	47,973	371,294	9,041,213
1891	Apr. 27	Dec. 7	69,190	3,560,213	366,305	1,731	44,080	417,093	8,888,759
1892	Apr. 18	Dec. 6	64,993	4,901,132	512,844	1,930	39,698	459,146	11,214,333
1893	May 1	Dec. 5	87,530	4,014,556	588,545	2,470	19,426	415,180	10,796,572
1894	Apr. 17	Dec. 6	99,573	6,548,876	722,788	412	21,417	451,185	13,195,860
1895	Apr. 25	Dec. 11	107,452	8,062,209	740,700	100	23,876	463,308	15,062,580
1896	Apr. 21	Dec. 8	116,872	7,909,250	684,986	240	17,731	520,851	16,239,061
1897	Apr. 21	Dec. 14	122,324	10,633,715	805,612	5	6,249	579,048	18,982,755
1898	Apr. 11	Dec. 14	124,226	11,706,960	895,485	.....	4,670	623,146	21,234,664
1899	Apr. 26	Dec. 20	120,090	15,328,240	1,038,057	487	39,063	587,484	25,255,810
1900	Apr. 19	Dec. 16	131,066	16,443,568	909,651	110	48,902	541,397	25,643,073
1901	Apr. 20	Dec. 21	98,601	18,090,618	1,072,124	.....	46,584	558,041	28,403,065
1902	Apr. 1	Dec. 20	120,612	24,277,555	1,091,471	1	38,919	740,100	35,961,146
1903	Apr. 2	Dec. 15	112,877	21,654,898	1,003,192	.....	21,300	659,839	34,674,437
1904	Apr. 30	Dec. 26	109,605	19,635,797	923,280	1,356	27,093	732,009	31,546,106
1905	Apr. 10	Dec. 20	106,520	31,332,637	966,806	41	10,899	836,583	44,270,680
1906	Apr. 13	Dec. 22	107,633	35,357,042	900,631	.....	6,222	1,134,851	51,751,080

St. Marys Falls Canal, Michigan, State lock, 1855 to 1887.
St. Marys Falls Canal, Michigan, Weitzel lock, since September 1, 1881.
St. Marys Falls Canal, Michigan, Poe lock, since August 3, 1896.
Sault Ste. Marie Canal, Ontario, Canadian lock since September 9, 1895.

Lockage data, St. Marys Falls Canal, Michigan.

Date.	Lockages.						Average time of passage of canal 1½ miles long, including lockage.	
	Weitzel lock.			Poe lock.				
	Number.	Average time.	Number of ships.	Number.	Average time.	Number of ships.	Actual.	Necessary.
		M. s.			M. s.		H. m.	H. m.
1887	4,165	38 47	9,355	.....	.....	.....	.....	.....
1888	3,845	39 09	7,803	.....	.....	.....	.....	.....
1889	4,684	40 03	9,579	.....	.....	.....	.....	.....
1890	4,970	41 40	10,557	.....	.....	.....	4 34	2 54
1891	4,981	41 11	10,191	.....	.....	.....	4 17	2 50
1892	5,867	42 13	12,580	.....	.....	.....	5 02	3 49
1893	5,553	40 40	12,008	.....	.....	.....	4 13	3 15
1894	6,431	40 12	14,491	.....	.....	.....	4 36	4 08
1895	7,039	39 06	16,793	.....	.....	.....	5 46	4 58
1896	5,462	36 35	11,035	961	56 45	2,406	2 45	2 09
1897	1,577	38 59	2,677	4,390	43 14	10,135	2 16	1 42
1898	2,682	33 30	4,513	4,326	43 05	9,545	2 13	1 14
1899	4,007	32 05	6,935	4,382	46 58	9,545	2 19	1 14
1900	4,153	20 43	7,093	4,326	34 21	9,276	2 11	1 10
1901	4,074	24 22	7,004	4,337	36 02	8,833	2 41	1 34
1902	4,149	22 09	6,469	5,278	37 58	11,119	2 37	1 29
1903	3,467	20 37	5,173	4,928	34 45	9,070	2 21	1 24
1904	3,219	22 43	4,747	4,074	34 30	7,406	2 18	1 23
1905	4,469	22 57	6,561	5,288	35 15	9,458	2 11	1 39
1906	4,522	22 59	6,507	5,845	34 31	9,968	2 33	1 48
Summation	89,316	33 54	172,071	48,135	38 16	96,761	3 10	2 14

Average time of lockage through the Canadian lock, 15 minutes.
A single steamer has been locked through the Weitzel lock in 10 minutes.
A single steamer has been locked through the Poe lock in 11 minutes.
A single steamer has been locked through the Canadian lock in 8 minutes.
The average time of passage per ship has been 1 to 6 minutes less than the average time of lockage.

Maximum number of lockages in a day.

Date.	Number of lockages.	Number of ships.	Registered tonnage.	Freight tonnage.
WEITZEL LOCK.			*Net tons.*	*Net tons.*
July 19, 1895	41	100	79,197	58,897
July 28, 1895	41	85	89,574	88,298
July 9, 1896	41	81	68,324	54,813
POE LOCK.				
May 15, 1899	36	93	118,601	75,747
CANADIAN LOCK.				
June 24, 1905	34	52	45,144	36,116

Maximum freight for a day.

Date.	Number of lockages.	Number of ships.	Registered tonnage.	Freight tonnage.
WEITZEL LOCK.			*Net tons.*	*Net tons.*
September 9, 1895	31	98	85,192	105,542
POE LOCK.				
June 25, 1906	28	50	151,590	284,293
CANADIAN LOCK.				
November 6, 1906	27	51	130,477	228,303

Comparative statement of traffic through Poe, Weitzel, and Canadian locks since the opening of the Canadian Canal in 1895.

POE LOCK.[a]

Year.	Passages.	Lockages.	Registered tonnage.	Freight tonnage.	Passengers.
1896	2,401	961	2,992,200	3,489,448	3,695
1897	10,135	4,390	12,120,867	13,058,291	15,178
1898	9,545	4,326	13,224,816	16,664,519	11,112
1899	9,545	4,382	14,844,888	19,924,822	9,182
1900	9,276	4,326	15,632,102	21,548,949	12,125
1901	8,833	4,337	16,916,836	23,250,661	6,513
1902	11,119	5,278	22,260,719	29,735,671	10,792
1903	9,070	4,928	18,841,962	27,790,831	13,906
1904	7,406	4,074	15,882,986	24,640,923	8,355
1905	9,458	5,288	24,176,472	36,543,484	12,763
1906	9,968	5,845	28,138,888	43,083,490	14,202

WEITZEL LOCK.

1895	16,793	7,039	16,089,878	14,471,648	30,910
1896	11,040	5,462	9,904,788	8,189,576	18,743
1897	2,677	1,577	1,702,969	981,335	13,527
1898	4,513	2,682	2,646,793	1,519,632	16,446
1899	6,935	4,007	4,176,601	2,327,317	24,482
1900	7,093	4,153	4,504,680	2,058,405	24,188
1901	7,004	4,074	5,305,498	2,331,377	23,188
1902	6,469	4,149	5,147,302	1,497,124	11,986
1903	5,173	3,467	4,156,902	1,381,421	9,250
1904	4,747	3,219	4,277,056	1,876,993	13,251
1905	6,561	4,469	6,944,761	2,258,706	15,638
1906	6,507	4,522	6,650,905	2,096,802	16,723

CANADIAN LOCK.[b]

1895	1,163	695	716,903	590,932	746
1896	5,174	3,043	4,352,430	4,560,037	14,628
1897	4,359	2,604	3,796,097	4,943,129	11,508
1898	3,703	2,525	2,751,145	3,050,513	15,868
1899	3,775	2,610	2,936,858	3,003,671	15,418
1900	3,083	2,206	2,179,052	2,035,719	22,242
1901	4,204	2,910	2,404,642	2,821,027	29,962
1902	5,071	3,419	4,547,561	4,728,351	36,599
1903	4,358	3,247	4,737,580	5,502,185	32,019
1904	3,967	3,022	4,204,096	5,028,190	16,089
1905	5,660	4,035	5,496,466	5,468,490	25,803
1906	5,680	4,156	6,308,531	6,570,788	32,108

[a] Opened August 3, 1896.
[b] Opened September 9, 1895.

Depth of water in Poe lock.

[Monthly averages from daily readings.]

Year.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
1896	.....	.....	.....	.....	20.48	20.34	19.88	19.78	19.69
1897	19.36	19.82	20.22	20.63	20.80	20.60	20.31	19.99	19.77
1898	19.33	19.61	19.99	20.35	20.39	20.30	20.10	19.96	19.89
1899	20.01	19.94	20.47	20.84	20.98	21.01	20.70	20.44	20.37
1900	19.82	19.70	19.80	20.18	20.52	20.94	21.02	20.86	20.59
1901	20.11	19.96	20.20	20.39	20.60	20.17	20.08	19.72	19.42
1902	18.76	19.09	19.31	19.74	19.86	19.80	19.47	19.41	19.16
1903	18.95	19.33	19.55	19.84	19.97	20.08	20.01	19.71	20.31
1904	20.08	19.93	20.46	20.62	20.70	20.77	20.77	20.43	20.29
1905	19.89	20.04	20.29	20.70	20.75	20.78	20.72	20.43	20.14
1906	20.17	20.25	20.53	20.68	20.68	20.54	20.82	20.12	20.17

Saw logs and pulp wood rafted down St. Marys rapids.

Year.	Saw logs.		Pulp wood.		Year.	Saw logs.		Pulp wood.	
	Number of rafts.	Saw logs.	Number of rafts.	Pulp wood.		Number of rafts.	Saw logs.	Number of rafts.	Pulp wood.
		M.ft.B.M.		*Cords.*			*M.ft.B.M.*		*Cords.*
1885	7	13,000			1896	a3	2,200		
1886	15	21,000			1897	2	4,500		
1887	17	31,950			1898	2	3,000	2	3,700
1888	a17	29,450			1899	1	2,000	6	15,000
1889	5	9,000			1900	5	8,500	5	15,500
1890	11	20,450			1901	4	9,000	5	10,100
1891	12	25,800			1902	2	5,000	5	6,500
1892	22	39,500			1903				
1893	16	29,100	1	500	1904			5	19,500
1894	6	18,586			1905	3	1,300	6	16,000
1895	2	4,500			1906	1	1,179	4	13,500

a Includes 1 raft, the number of feet it contained not being known.

GROWTH OF LAKE SUPERIOR COMMERCE.

The movement of freight to and from Lake Superior previous to the opening of the State Canal in 1855 was entirely by boat to Sault Ste. Marie, where the cargoes were unloaded, then taken across the portage 1 mile long and reloaded aboard boats.

In 1851 about 12,600 tons passed over the tramway portage; the transshipments to Lake Superior ports comprised the articles hay, oats, dry goods, groceries, and mining machinery to the value of $1,000,000, and those to lower lake ports included copper, iron blooms, and fish, valued at $675,000.

During the fifty-two years the canal has been in commission the yearly traffic has increased from a minimum of 14,503 tons to a maximum of 51,751,080 tons.

The increase in tonnage of each year's traffic over that of the preceding year has averaged about 20 per cent. For each decade the average percentage of yearly increase and the total tonnage are as follows:

	Tons.
1855–1864 (44 per cent)	1,203,358
1865–1874 (12 per cent)	4,829,247
1875–1884 (17 per cent)	14,868,639
1885–1894 (17 per cent)	80,343,218
1895–1904 (12 per cent)	253,002,697
1905	44,270,680
1906	51,751,080
Total	450,268,919

HISTORICAL NOTES.

The St. Marys Rapids are about half a mile wide and three-fourths of a mile long. The fall ranges from 16½ to 20½ feet with the varying stages of water.

The first canal was built on the Canadian side of the river by the Northwest Fur Company in 1797–98. The lock was 38 feet long, 8 feet 9 inches wide, with a lift of 9 feet. A towpath was made along the shore for oxen to track the bateaux and canoes through the upper part of the rapids. The lock, excepting its timber floor and miter sills, was destroyed in 1814 by United States troops from Mackinac Island under command of Major Holmes.

The first ship canal, known as the State Canal, was built on the American side of the river in 1853 to 1855, some 750,000 acres of land in Michigan having been granted by the United States Congress for the construction thereof. The canal was 1½ miles long, 64 feet wide at bottom, 100 feet wide at water surface, and 13 feet deep. There were two tandem locks of masonry, each 350 by 70 feet, having 11½ feet of water on the miter sills and a lift of about 9 feet each. Capt. A. Canfield, Topographical Engineers, U. S. Army, made the original surveys. Charles T. Harvey was superintendent of construction, and the St. Marys Falls Ship Canal Company was the contractor. The locks were destroyed in 1888 by excavations for the present Poe lock.

The Weitzel lock, 515 feet long, 80 feet wide in chamber, narrowing to 60 feet at the gates, with 17 feet depth of water on the miter sills when the upper pool is 601.9 feet and the lower pool 584.4 feet above mean tide at New York, was built by the United States in the years 1870 to 1881. During the same period the depth of the canal was increased to 16 feet, the mean width to 160 feet, and the stone slope walls were replaced with timber piers having a vertical face. Gen. Orlando M. Poe was the engineer officer in charge of the district from 1870 to 1873, and Gen. Godfrey Weitzel from 1873 to 1882. Alfred Noble was the assistant engineer in local charge from 1870 to 1882. Boyle & Roach were the principal contractors.

The Canadian canal, 1½ miles long, 150 feet wide, and 22 feet deep, with lock 900 feet long and 60 feet wide, having 22 feet of water on the miter sills, was built on the north side of the river in the years 1888 to 1895. Hon. Collingwood Schreiber was chief engineer of Dominion canals, etc., and W. G. NcNeill Thompson was the government engineer in local charge of construction work. Ryan & Haney were the contractors.

The Poe lock, 800 feet long, 100 feet wide, and having 22 feet of water on the sills, was built by the United States in the years 1887 to 1896. Gen. Orlando M. Poe was the engineer officer in charge of the district from 1883 to 1895, and E. S. Wheeler the assistant engineer in local charge of construction work from 1882 to 1897. Hughes Bros. & Bangs were the principal contractors.

The American canal since 1892 has been deepened to 25 feet, and its entrance piers have been extended so that its total length at the falls is now 1⅜ miles. Its width is variable, being 500 feet at the upper entrance, 108 feet at the canal gate, 270 feet at the basin above locks, and 1,000 feet at the lower entrance. Dunbar & Sullivan and J. B. Donnelly were the principal contractors.

The canal also practically includes those parts of the channels through St. Marys River, which have been improved through shoals of sand, clay, bowlders, sandstone, and limestone rock. The United States Government made the first appropriation for improving the river channels in 1856. The Lake George route was improved for 12 feet draft, 1857 to 1860 and 1866 to 1869. The depth was increased to 16 feet, 1879 to 1883. The Hay Lake route was improved for a depth of 20 feet at mean stage of water, years 1882 to 1894. Betterment of the channels has been continued every year since, so that the dredged areas now total 34 miles in length with least width of 300 feet, increasing at angles and other critical places up to 1,000 feet. In 1903 excavation of channels was begun for 21 feet at lowest stage of water.

The engineer officers in past charge of the river improvements were Capt. A. W. Whipple, 1858–1861; Col. T. J. Cram, 1866–1870; Maj. O. M. Poe, 1870–1873; Col. G. Weitzel, 1873–1882; Maj. F. U. Farquhar, 1882–83; Col. O. M. Poe, 1883–1895; Col. G. J. Lydecker, 1896–1902; and Maj. W. H. Bixby, 1902–1904. J. Hickler & Sons, C. F. & H. T. Dunbar, and Carkin Stickney & Cram were the principal contractors.

The cost of the several improvements, stated in round numbers, is as follows:

Locks and canal of 1855	$1,000,000
Weitzel lock	1,000,000
Poe lock	3,000,000
Widening and deepening canal	3,000,000
Improving channel through river	6,000,000
Canadian lock, canal, and approaches	5,000,000

Hydraulic power is used for operating the American locks, a pressure of 115 pounds per square inch being used for the Weitzel lock machinery and a pressure of 200 pounds for the Poe lock machinery. Electricity generated by water power is used for operating the Canadian lock.

The Poe lock can be filled or emptied in about seven minutes, and the gates opened or closed in two minutes. The Weitzel lock can be operated in about the same time as the Poe lock. The Canadian lock can be operated in about 8 minutes. An up-lockage of a single boat 350 feet long has been made through the Poe lock in eleven minutes, but the average time spent in making a lockage last season was nearly thirty minutes, most of which was due to the slow movement of boats while entering and leaving locks. Frequently as many as five boats were included in a single lockage. The average time of lockage through the Canadian lock was about sixteen minutes.

From 1855 to 1881 the canal was controlled by the State of Michigan and tolls were charged to cover operating and repair expenses, the rate at first being 6½ cents per registered ton, which was gradually reduced to 2½ cents. Similarly the

minimum charge for lockage of a boat was reduced from $5 to $3. Since control was transferred to the United States, in 1881, the American canal has been free for public use by all nations. Likewise the Canadian canal has not collected tolls for either foreign or domestic commerce.

The lock force under State control consisted of about 20 men, having one watch only, as night navigation of the river was then impossible. Under United States control two watches, of twelve hours each were established in 1881, and same continued to 1891, when three watches of eight hours each were organized. The force engaged in passing boats has been increased with the growth of commerce, the number now aggregating 74; in addition there are 19 others employed as clerks, watchmen, and janitors.

Expenses for operating and care of St. Marys Falls Canal, Michigan.

Year.	Operating.	Repairs.	Total.	Cost per freight ton.
				Mills.
1882	$21,185.86	$10,021.62	$31,207.48	16.62
1883	22,134.97	13,374.73	35,509.70	18.94
1884	20,337.61	10,875.32	31,212.93	12.28
1885	18,635.27	8,607.18	27,242.45	9.49
1886	18,871.84	6,529.11	25,400.95	6.86
1887	18,887.11	3,251.81	22,138.92	4.53
1888	22,858.57	7,040.15	29,898.72	5.36
1889	23,987.45	6,762.00	30,749.45	4.44
1890	22,737.53	11,586.32	34,323.85	4.14
1891	34,657.27	13,673.62	48,330.89	5.80
1892	37,895.93	23,493.81	61,389.74	6.07
1893	34,402.15	8,009.97	42,412.12	3.91
1894	43,103.27	12,109.82	55,213.09	4.95
1895	39,063.20	11,845.47	50,908.67	3.73
1896	34,806.92	25,956.36	60,763.28	4.22
1897	46,750.02	31,354.03	78,104.05	6.60
1898	43,464.99	15,425.73	58,890.72	3.93
1899	65,142.64	25,165.30	90,307.94	4.66
1900	59,282.46	20,010.80	79,293.26	3.23
1901	59,457.05	16,018.28	75,475.33	3.64
1902	66,914.75	20,779.05	87,693.80	2.86
1903	62,648.42	21,228.38	83,876.80	2.65
1904	66,563.96	26,684.51	93,248.47	4.25
1905	64,423.96	20,822.39	85,246.35	2.48
1906	69,259.66	20,740.29	89,999.95	1.99

P P 4.

IMPROVEMENT OF HAY LAKE AND NEEBISH CHANNELS, ST. MARYS RIVER, MICHIGAN.

This improvement was commenced in 1883, and the channel opened to navigation on June 7, 1894, was 300 feet wide, 20 feet deep, and being 4 feet deeper and 11 miles shorter than the old one by Lake George, immediately became the traveled route for all shipping passing through St. Marys River. Night navigation was made possible and is fairly safe for upbound ships and a limited number of downbound ones. Previous to the completion, in 1897, of the west channel to 21 feet at Sailors Encampment, boats frequently grounded in the east channel on the smooth limestone rock. Since 1898 several critical places in the channel have been widened and deepened.

The river and harbor acts of June 13, 1902, and March 3, 1905, adopted a project which provided for a channel of 21 feet navigable depth at low water and 1,500 feet width from St. Marys Falls Canal to the upper entrance to Hay Lake (Little Rapids), thence a least width of 600 feet to the foot of Hay Lake, thence deepening to 21 feet the present 300-foot channel to Mud Lake via Middle Neebish, and opening a new 300-foot channel to Mud Lake via West Nee-

bish, thus providing separate channels through this reach for up and down bound boats.

The total expenditures to June 30, 1907, on the Hay Lake and Neebish projects combined are $6,472,623.45, leaving $1,186,491.55 available for further payment.

Operations for the fiscal year were as follows:

The channel from the canal to Little Rapids is being widened at Bayfield shoal 500 feet to the north of the center line to a depth of 21 feet below 580.3. One dredge working 1,187.3 hours removed 21,457 cubic yards, and one derrick boat working 1,214.2 hours removed 5,545 cubic yards of sand, stones, and bowlders from an area of 27,468 square yards. Ninety-eight per cent of the work has been done. The contractor worked one hundred and forty days in excess of contract time under an authorized extension.

The section of the river between Frechette Point and Six-mile Point was completed. Three dredges employed by the contractor worked 831.4 hours and excavated 69,560 cubic yards from an area of 140,028 square yards. A dredge employed by the working hour removed a small shoal left from the preceding contract, and continued the extension of the channel between cross section 240 and the 21-foot contour in Hay Lake. This dredge has worked 667.5 hours, removing 172,273 cubic yards.

A channel across the flats foot of Hay Lake, forming entrance to the West Neebish, 32,300 feet long, 21 feet deep below 579.3, and 300 feet wide, increasing to 800 feet at angle, was completed. The six dredges employed worked 4,016.3 hours and extended the channel 4,300 feet, excavating 747,765 cubic yards of sand, silt, and clay from an area of 798,313 square yards. The excavation was completed in 80 per cent of the contract time.

The work at the West Neebish Rapids consists in excavating a channel 13,300 feet long, 300 feet wide, and 22 feet deep below a slope 579.3 to 578.8, with vertical sides in the rock, and with stone retaining walls 6 feet above the low-water surface to mark both sides of the channel through the greater portion of the rock cut. Work was commenced September 9, 1904, and during the year the excavation was extended 3,590 feet, the four cableways removing 651,334 cubic yards of rock, full-rate material, and 30,539 cubic yards, half-rate material. The channelers cut 77,136 square feet of face. There were 56,524 holes drilled to an average depth of 9½ feet, and 340,639 pounds of dynamite used for blasting. The retaining walls were extended for a distance of 5,730 linear feet, the face measurement being 9,331 square yards. Besides the regular wall, 347 cubic yards of dry masonry was placed in special wall ends. On the earth section two dredges at various times worked 3,267.2 hours, and excavated 166,700 cubic yards of limestone rock, bowlders, clay, and sand. Eighty-two and three-tenths per cent of the work on this contract has been done in 88 per cent of the contract time.

The dredging of a new channel across the flats at head of Mud Lake, 19,300 feet long, 21 feet below 578.8, and 300 feet wide, increasing to 900 feet at the angle, was continued for a distance of 4,000 feet; the three dredges employed worked 1,814.5 hours, removing 462,658 cubic yards of sand, clay, and bowlders from an area of 214,000 square yards. Rate of progress 94 per cent of excavation in 92 per cent of contract time.

The deepening of the present channel between Everns Point and the turning buoy in Mud Lake was commenced May 21, 1907. One dredge worked 414.9 hours and excavated 25,512 cubic yards from an area of 46,600 square yards. Forty per cent of the work has been done in 56 per cent of the contract time.

The widening of the entrance angle from Hay Lake to the Middle Neebish was completed. Three dredges worked 947.1 hours and excavated 166,042 cubic yards, and one derrick boat worked 544.6 hours and excavated 410 cubic yards of sand, clay, bowlders, and sandstone rock from an area of 72,000 square yards.

The dredge employed by the working hour removed two ridges near the western side of the channel, one at the lower angle, Hay Lake, and one at the black spar buoy No. 19. The dredge worked one hundred and sixty hours and removed 41,856 cubic yards from an area of 15,643 square yards.

The derrick boat employed by the working hour removed a ridge above grade at a point below Johnstons dock, Sailors Encampment, working 17.6 hours and removing a small amount of broken limestone rock.

The work of constructing cribs to mark the side lines of the West Neebish channel was commenced. Five cribs are partially completed. Five hundred and eighty thousand feet, B. M., of hemlock timber was purchased for the building of these cribs.

Fifty-six thousand feet, B. M., of fir timber has been ordered to build one deck scow 80 by 22 feet, and to rebuild the sounding raft 130 by 20 feet. This timber has not yet been delivered.

Surveys were made on all the sections on which work was in progress or contemplated, and the 136,000 soundings taken are being mapped and used in computing estimates. There were 764 section stakes driven, 20 gauge boards placed, and numerous dumping-ground buoys placed for the use of the contractors.

Accidents.—On December 16, 1906, a charge of dynamite, which had missed fire, was accidentally exploded, killing two of the contractor's employees at the West Neebish rock cut.

The supervision of this work has been in charge of Assistant Engineer L. C. Sabin.

Money statements.

MIDDLE AND WEST NEEBISH CHANNELS, ST. MARYS RIVER, MICHIGAN.

July 1, 1906, balance unexpended	$1,203,408.72
Amount appropriated by sundry civil act approved March 4, 1907	1,000,000.00
	2,203,408.72
June 30, 1907, amount expended during fiscal year, for works of improvement	[a] 1,354,292.36
July 1, 1907, balance unexpended	849,116.36
July 1, 1907, outstanding liabilities	289,628.00
July 1, 1907, balance available	559,488.36
July 1, 1907, amount covered by uncompleted contracts	429,515.00

[a] Includes $18.03 paid by Treasury Department, account of Michigan Central Railroad Company; $12.08 paid by Treasury Department, account of Duluth, South Shore and Atlantic Railway Company, and $2.85 paid by Treasury Department, account of Superintendent of Documents.

Improvement of
MARYS RIVER, MICHIGAN.
Project 1902.
has. E.L.B. DAVIS, Corps of Engineers, U.S.A.
in charge.

MAP

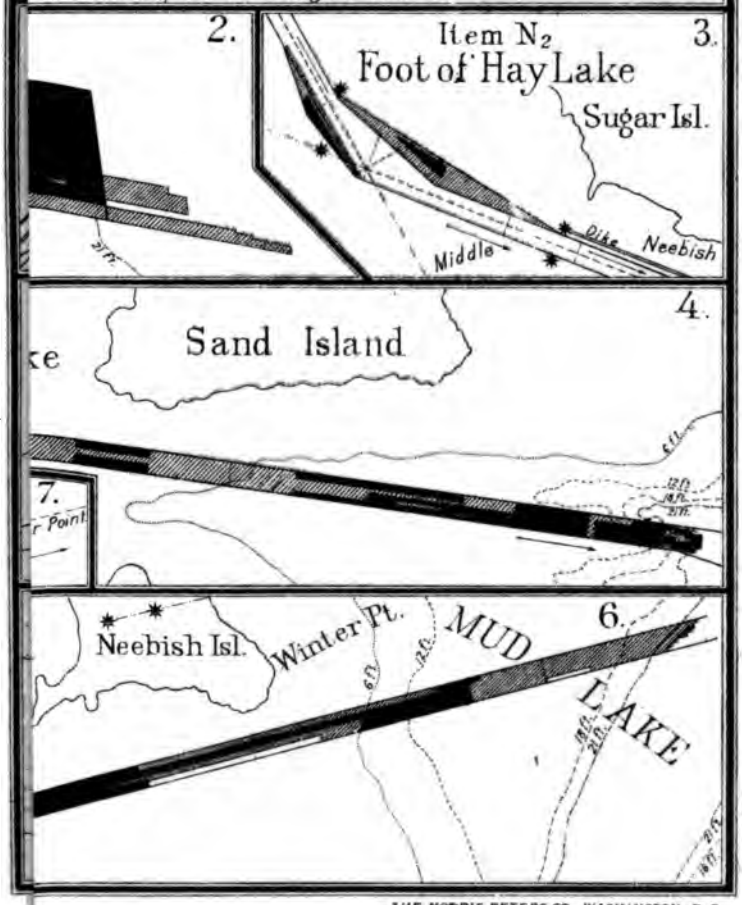
Work done during fiscal year 1906-7.

Scale in feet.

0 1000 2000 3000 4000 5000 FT.

Work done during fiscal year 1906-7.

Work done prior to fiscal year 1906-7.



THE NORRIS PETERS CO., WASHINGTON, D. C.

HAY LAKE AND NEEBISH CHANNELS.

July 1, 1906, balance unexpended	$405,050.67
June 30, 1907, amount expended during fiscal year, for works of improvement	67,675.48
July 1, 1907, balance unexpended	337,375.19
July 1, 1907, outstanding liabilities	8,666.00
July 1, 1907, balance available	328,709.19
July 1, 1907, amount covered by uncompleted contracts	31,054.00
Amount (estimated) required for completion of existing project	750,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897.	500,000.00

APPROPRIATIONS.

HAY LAKE CHANNEL.

August 2, 1882	$200,000
July 5, 1884	125,000
August 5, 1886	150,000
August 11, 1888	500,000
September 19, 1890	400,000
March 3, 1891	300,000
August 5, 1892	115,000
March 3, 1893	225,000
August 18, 1894	150,000
March 3, 1899	100,000
June 6, 1900	250,000
June 28, 1902	144,115

MIDDLE AND WEST NEEBISH CHANNELS.

June 13, 1902	$500,000
March 3, 1903	800,000
March 3, 1905	1,200,000
June 30, 1906	1,000,000
March 4, 1907	1,000,000

HAY LAKE AND NEEBISH CHANNELS.

March 3, 1905	500,000
Total	7,659,115

CONTRACTS IN FORCE.

CONTRACT DATED APRIL 7, 1904.

Name of contractor: MacArthur Brothers Company, Chicago, Ill.

Amount and character of work: $2,419,560; rock and earth excavation at West Neebish Rapids.

Price per unit: Cofferdam, $20,000; earth excavation, at 56 cents per cubic yard, bank measurement (full rate), and 28 cents per cubic yard, bank measurement (half rate); rock excavation, $1.36 per cubic yard, bank measurement (full rate), and 68 cents per cubic yard, bank measurement (half rate); retaining walls, at $5.50 per square yard of channel face.

Date of approval: May 7, 1904.

Date of beginning of work: July 11, 1904.

Date of expiration: About June 10, 1908 (one thousand two hundred good working days).

CONTRACT DATED APRIL 11, 1904.

Name of contractor: Samuel O. Dixon, Milwaukee, Wis.

Amount and character of work: $685,312.50 (estimated); dredging section 1, Hay Lake.

Price per unit: 12¾ cents per cubic yard, bank measurement (full rate), and 6⅜ cents per cubic yard, bank measurement (half rate).

Date of approval: April 18, 1904.

Date of beginning of work: September 1, 1904.

Date of expiration: About July 24, 1907 (five hundred good working days).

Date of completion: October 31, 1906.

CONTRACT DATED APRIL 16, 1904.

Name of contractor: Chicago and Great Lakes Dredge and Dock Company, Chicago, Ill.

Amount and character of work: $466,915.50; dredging section 2, Mud Lake.

Price per unit: Soft material, at $0.129 per cubic yard, bank measurement (full rate), and $0.0645 per cubic yard, bank measurement (half rate). Hard material, at $0.98 per cubic yard, bank measurement (full rate), and $0.49 per cubic yard, bank measurement (half rate). Rock, at $8.25 per cubic yard, bank measurement (full rate), and $4.125 per cubic yard, bank measurement (half rate).

Date of approval: May 6, 1904.

Date of beginning of work: September 1, 1904.

Date of expiration: About July 24, 1907 (five hundred good working days).

CONTRACT DATED JULY 7, 1905.

Name of contractor: Hickler Brothers, Sault Ste. Marie, Mich.

Amount and character of work: About $102,000; dredging Item N_2, Middle Neebish Angle.

Price per unit: Hard material, 67 cents per cubic yard, bank measurement (full rate), and 33½ cents per cubic yard, bank measurement (half rate). Soft material, 14 cents per cubic yard, bank measurement (full rate), and 7 cents per cubic yard, bank measurement (half rate).

Date of approval: July 18, 1905.

Date of beginning of work: August 9, 1905.

Date of expiration: About November 10, 1906 (two hundred and fifty good working days).

Date of completion: November 9, 1906.

CONTRACT DATED JULY 8, 1905.

Name of contractor: H. W. Hubbell & Co., Saginaw, Mich.

Amount and character of work: About $45,325; dredging Item A 1, Bayfield Shoal.

Price per unit: 49 cents per cubic yard, bank measurement.

Date of approval: July 19, 1905.

Date of beginning of work: August 12, 1905.

Date of expiration: Indefinite (as extended).

CONTRACT DATED SEPTEMBER 5, 1906.

Name of contractor: Great Lakes Construction Co., Buffalo, N. Y.

Amount and character of work: About $23,962.50; dredging Shoal No. 28 in

Price per unit: 22½ cents per cubic yard, bank measurement.

Mud Lake.

Price per unit: 22½ cents per cubic yard, bank measurement.

Date of approval: September 18, 1906.

Date of expiration: About August 12, 1907.

CONTRACT DATED NOVEMBER 8, 1906.

Name of contractor: The Lake Erie Dredging Company, Buffalo, N. Y.

Amount and character of work: About $65,000; time work by dredging plant.

Price per unit: $32.50 per working hour.

Date of approval: November 19, 1906.

Date of beginning of work: November 12, 1906.

Date of expiration: About November 4, 1907 (one hundred and fifty good working days).

WRITTEN PROPOSAL AND WRITTEN ACCEPTANCE DATED JANUARY 28, FEBRUARY 19 AND 21, 1907.

Contractor: MacArthur Brothers Company, Chicago, Ill.

Amount and character of work: $5,810; excavating site and constructing dry masonry wall ends.

Price per unit: Excavating, $1.36 per cubic yard; constructing dry masonry, $4.15 per cubic yard.

Date of beginning of work: About May 1, 1907.

Date of expiration: About June 15, 1908.

EMERGENCY CONTRACT DATED APRIL 1, 1907.

Name of contractor: Peninsula Bark and Lumber Company, Sault Ste. Marie, Mich.

Amount and character of work: About $1,800; furnishing and delivering hemlock timber.

Price per unit: $18.50 per M feet B. M.
Date of beginning of work: April 11, 1907.
Date of expiration: June 15, 1907; time extended sixty days.

EMERGENCY CONTRACT DATED APRIL 18, 1907.

Name of contractor: Soo Hardware Company, Sault Ste. Marie, Mich.
Amount and character of work: About $2,400; furnishing and delivering drift bolts, tie rods, washers, etc.
Unit prices per 100 pounds: Drift bolts, $2.06; machine bolts, $2.87½; tie rods, $2.87½; pressed washers, $3.67½; cast washers, $2.12½, and steel plate, $2.32½.
Date of expiration and completion: May 31, 1907.

P P 5.

IMPROVEMENT OF ST. CLAIR FLATS CANAL, MICHIGAN.

The history of this improvement to June 30, 1896, is outlined in the Report of the Chief of Engineers for that year, pages 2881–2889, no work having been done from 1896 to 1901, inclusive, the then existing projects having been completed.

The river and harbor act of June 13, 1902, contained new provisions to authorize the construction of a second channel similar to the one already in use and parallel to it, but separated therefrom by a dike of about 100 feet width, so as to provide a channel of 20 feet minimum depth and about 300 feet width from Lake St. Clair up into St. Clair River for ascending boats and a similar channel for descending boats.

This second channel was constructed under contract by The M. Rabbitt & Sons Co., who completed it on October 17, 1906, although the work had so far progressed by September 3, 1906, as to allow this channel to be thrown open to lake commerce on that date. During the past fiscal year the lower pierhead and 74 linear feet of revetment were built and 783,564 cubic yards of material excavated, this excavation extending over a distance of 17,460 linear feet below the upper light-house 300 feet in width.

The amount of commerce passing through the canal during the season of 1906 was 60,589,441 tons of 2,000 pounds, its estimated value being $629,524,292.

The general supervision of this work was in charge of Chief Assistant Engineer E. S. Wheeler.

When work was commenced under this new project there was an unexpended balance of former appropriations of $2,159.39, which, added to the new appropriation, made a total available of $332,159.39. All of this amount has been expended and in addition $86,491.28 were diverted from the appropriation for "Improving St. Marys River at the Falls."

The total amount appropriated for improving St. Clair Flats Canal since 1866 is $1,094,810, in addition to the $86,491.28 diversion, making the total expenditures $1,181,301.28.

Final report on the project for the construction of new channel is appended.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
Detroit, Mich., March 29, 1907.

GENERAL: I have the honor to submit the following report on the second channel through St. Clair flats, Michigan, the construction of which was completed in accordance with the approved project on October *17, 1906.*

NEED OF A SECOND CHANNEL.

The necessity for a second channel was indicated as long ago as 1896, when Lieut. Col. G. J. Lydecker, in his annual report stated that—

> The canal is now much too small to furnish proper facilities for the enormous and rapidly increasing commerce passing through it.

The first canal through the flats was completed in 1871. Unfortunately no statistics of the then existing commerce are available, but a reference to the accurate statistics for St. Marys Falls Canal shows the tremendous growth and development of the lake commerce since that date. In 1871 a total of 585,583 tons passed through the Sault locks. Last year (1906) this commerce attained the enormous total of 51,751,080 tons. As the accurate statistics compiled during recent years of the commerce passing through St. Clair Flats Canal show the traffic through this channel to be from 15 to 25 per cent greater than through the Sault locks, some conception may be formed of the importance of this waterway.

In 1899, when the Sault commerce had reached a total of over 25,000,000 tons, Colonel Lydecker was so impressed with the inadequacy of the single narrow channel through the flats, that, in his annual report, he reiterated his former statement, using the following language:

> The matter is of such importance that I feel justified in taking the exceptional course of suggesting that it be brought to the attention of Congress with recommendation that action be taken with a view of doubling the commercial capacity of the channel so far as width is concerned.

CANAL BLOCKADES.

Before the close of the navigation season in which the foregoing recommendation was made, the need of additional channel way through the flats was strongly emphasized by the grounding of the tow barge *John Fritz* at the lower entrance to the canal on December 4, 1899, causing a blockade by which the passage of deep-draft vessels was made impossible for a period of one and one-half days.

The imperative necessity for a second channel was still further accentuated on October 9, 1903, when, as a result of collision, the steamer *John N. Glidden* sank diagonally across the canal, leaving an opening of only about 70 feet for the passage of vessels.

RIVER AND HARBOR ACTS.

The emergency river and harbor act of June 6, 1900, called for a survey and estimate, viz:

> St. Clair Flats Canal, in Lake St. Clair: With a view to doubling the capacity of the so-called St. Clair Flats Canal.

A report on a preliminary examination was made on July 28, 1900, followed by a report on a survey, dated December 6, 1900, in which the cost of the additional channel was estimated at $330,000. Both reports, with Department action thereon, were printed as Document No. 234, Fifty-sixth Congress, second session.

The river and harbor act approved June 13, 1902, appropriated this amount, and also authorized the diversion from the unexpended balances of St. Marys River funds of a sufficient amount for the completion and further improvement of the St. Clair Flats Canal.

PRELIMINARY WORK.

The preliminary work in connection with the actual construction of the new channel was as follows:

In 1902 borings to determine the character of the material were made to a depth of 3 feet below the proposed grade over the entire area to be improved, at a cost of $1,200.

In February, 1904, an ice survey on which to base an estimate of the amount of material to be excavated was made, at a cost of $1,098.

In the meantime studies and plans for the new pier work were made, and specifications prepared.

Advertisement and specifications for the work were issued on April 18, 1904, and bids opened on the following 18th of May. Eleven proposals were received, and the lowest, that of The M. Rabbitt & Sons Company, of Toledo, Ohio, was accepted in spite of spirited opposition on the part of several of the other bidders; the contract being entered into on June 11, 1904, and approved by the Chief of Engineers on June 29, 1904. This contract called for the construction of a second channel 300 feet wide to the westward of, and parallel to, the old canal, involving the removal of about 2,000,000 cubic yards of material, and the widening of the west pier from 50 feet to 100 feet for its entire length.

CONTRACT WORK.

The contractors commenced the work promptly, arriving at the canal with a part of their plant on July 9, 1904. They built a camp for their men, and on July 15, commenced the actual work of construction.

METHODS OF CONSTRUCTION.

The pile revetment was constructed by driving 38-foot round piles 6 feet apart, after which an 8-inch by 12-inch waling was placed at the top of the round piles, and a 6-inch by 12-inch about 16 feet below; against this, sheet piling of the Wakefield patent was driven. The sheet piles were composed of 3 pieces of 4-inch by 12-inch by 30 feet spiked together with ½-inch by 12-inch boat spikes. On top of the upper waling and sheet piling was placed a 12-inch by 12-inch timber bolted to the round piles. Outside of the piles was placed a protection waling of 8-inch by 12-inch oak. The round piles were tied to the opposite wall with 1½-inch tie-rods 100 feet long, spaced 6 feet apart for nearly the entire distance.

The round piles and sheet piling were driven without the use of a jet through a material of silt and soft clay.

The pierheads were constructed by driving a front and rear row of round piles 17 feet apart, the piles in the rows being 6 feet centers. Sheet piling was driven similar to that in the pile revetment. On top of the two rows of round piles was constructed a superstructure of cribwork built of 12-inch by 12-inch white pine. The first courses were bolted to the round piles with driftbolts, the following six courses being bolted to each other and cross-ties were placed every 6 feet to bind the two walls together. After this cribwork was completed, the whole was filled with earth filling pumped out from the new channel by the suction dredges.

DREDGING.

Two hydraulic and three dipper dredges were employed on the work. The contractor, evidently not realizing the magnitude of his undertaking, started the work on August 29, 1904, with one 18-inch hydraulic dredge, the *Sunny Jim*. The progress made by this one machine was very unsatisfactory, but no additional plant was placed on the work until July 6, 1905, when the 12-inch hydraulic dredge *Mamie E. Hoffman* appeared at the canal. These two machines were insufficient in capacity to excavate the channel within the contract-time limits, and under pressure from this office the contractor in 1906 added three powerful dipper dredges to his plant. These dipper dredges were employed principally at the ends of the channel, which were too distant from the dumping grounds to permit of the use of the hydraulic dredges.

The total amount of material removed under this contract was as follows: Above a grade of 20 feet, 1,847,928 cubic yards, bank measurement; between 20 and 21 feet, 196,873 cubic yards, bank measurement; total pay material, 2,044,801 cubic yards, bank measurement.

In addition to the above the contractor removed the following material for which the contract allows no payment: Between 21 and 22 feet, 186,729 cubic yards, bank measurement; below 22 feet, 59,117 cubic yards, bank measurement; total excavation, 2,290,647 cubic yards, bank measurement.

The amount below a grade of 22 feet was asked for by the contractor to facilitate a settlement with their subcontractors. The record of each dredge on the work is as follows:

Dredge.	Worked—		Time worked.		Cubic yards of material removed (estimated).
	From—	To—	Hrs.	Min.	
Sunny Jim	Aug. 29, 1904	Aug. 25, 1906	5,460	15	986,848
Hoffman	July 6, 1905	Aug. 27, 1906	3,000	30	332,924
Great Lakes No. 8	Apr. 18, 1906	Oct. 2, 1906	1,498	30	286,476
Great Lakes No. 3	Apr. 19, 1906	Oct. 17, 1906	1,540	55	367,912
Breymann	Aug. 27, 1906	.....do.....	392	00	70,641
Total					2,044,801

FIELD METHODS.

The field work consisted in placing the usual marks, stakes, buoys, etc., for defining the work, and for making monthly estimates. The four light-house towers were conspicuous marks and were used in locating points on the work. The position of the towers was first determined by triangulation and carefully plotted on the map, the method of the "three-point problem" being used. Tables were prepared, so that the plotting was done with the "beam-compass" method. This made the work of locating buoys, stakes, etc., very easy and accurate. Any point on the work, from which the angles between the light-houses had been properly measured with a sextant, could be plotted and its coordinates determined in five minutes with a probable error of less than 5 feet.

EXTRA WORK.

Considerable work not contemplated in the original estimate was found necessary. For example, four spots were found in the site of

the revetment where the bottom was so soft that it would not hold in place the lower end of the sheet piling. To remedy this the original sheet piling was replaced with piles 13 feet longer. It was also found advisable to increase the number of tie-rods, spacing them 6 feet apart for almost the entire distance instead of 12 feet as originally planned. Adjoining the upper pierhead, the revetment on the old canal side was so out of alignment for a distance of 107 feet that the new work could not be tied to it, and it was necessary to rebuild this section. At the lower pierhead the soft bottom encountered compelled the use of piles 10 feet longer than originally proposed. The total of the various items of increased cost is as follows:

First break	$1,981
Second break	2,894
Third break	2,874
Fourth break	678
Extra tie-rods	20,362
107 linear feet revetment	3,122
Lower pierhead, extra length piles	1,354
Total	33,265

The total amount paid to the M. Rabbit & Sons Company under the various items of their contract was as follows:

Item A—Excavation.

1,847,928 cubic yards, bank measurement, at 8¼ cents	$152,454.06
196,873 cubic yards, bank measurement, at 4⅛ cents	8,121.01
Total for excavation	160,575.07

Item B—Constructing pile revetment and pierhead superstructure.

[Material in place.]

2,791,644 feet B. M. sheet piles, at $45 per M	$125,623.98
392,481 feet B. M. pine timber, at $42 per M	16,484.20
57,519 feet B. M. hemlock stringers, at $42 per M	2,415.79
72,308 feet B. M. oak waling, at $50 per M	3,615.40
55,770 linear feet round piles, at 40 cents per linear foot	22,308.00
718,530 pounds tie-rods, at 6 cents per pound	43,111.80
57,343 pounds bolts, at 6 cents per pound	3,440.58
116,486 pounds spikes, at 6 cents per pound	6,989.16
Total for revetment	223,988.91
Total for excavation	160,575.07
Total for contract	384,563.98
Deduct cost of inspection after contract date for completion	140.80
Amount paid contractor	384,423.18

OPENING OF THE NEW CHANNEL.

On Saturday, September 3, 1906, the date set for completion by the contract, the new channel was formally opened by the 600-foot freighter *B. F. Jones*, upbound, owned by The Jones & Laughlin Steel Company, Capt. Charles L. Wilson, of the U. S. S. *Hancock*, taking charge of the *Jones* during the passage through the new cut; and on Monday, September 5, 1906, the new channel was opened to general navigation. The contractors deserve great credit for the energy displayed by them during the closing months of their contract, thus practically completing the work on time, so far as navigation interests were concerned.

FINANCIAL STATEMENT.

On July 1, 1902, there was an unexpended balance from appropriations prior to that of June 13, 1902, of $2,159.39. Of this amount $1,249.84 was expended in preliminary work prior to the approval on October 22, 1902, of the general project, leaving a balance of $909.55 of old appropriation.

This approved project provided for the expenditure of the following funds:

Appropriation, river and harbor act June 13, 1902	$330,000.00
Balance of previous appropriation	909.55
Diversion from St. Marys River appropriation	85,000.00
	415,909.55
Additional diversion from St. Marys River called for because of extra work referred to in paragraph 17	35,000.00
Amount deposited to credit of appropriation on account of damages to canal by passing vessels	381.58
Amount received from sale of old driftbolts, deposited to credit of appropriation	184.17
Total available	451,475.30

The total expenditures were as follows:

Under contract for new channel	$384,423.18
Superintendence and contingencies, including $5,000 applied on purchase of a warehouse and $7,868 for rebuilding U. S. S. *Hancock*	33,543.40
Total expenditures	417,966.58
Leaving a balance to be returned to the credit of appropriation for improving St. Marys River, Michigan, of	33,508.72
Total accounted for	451,475.30

The execution of the work was under the local charge of Chief Assistant Engineer E. S. Wheeler, assisted by Junior Engineer Bamlet Kent; and Junior Engineer H. R. Allen and Inspector E. J. Haynes for a portion of the time.

Very respectfully, your obedient servant,

CHAS. E. L. B. DAVIS,
Colonel, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

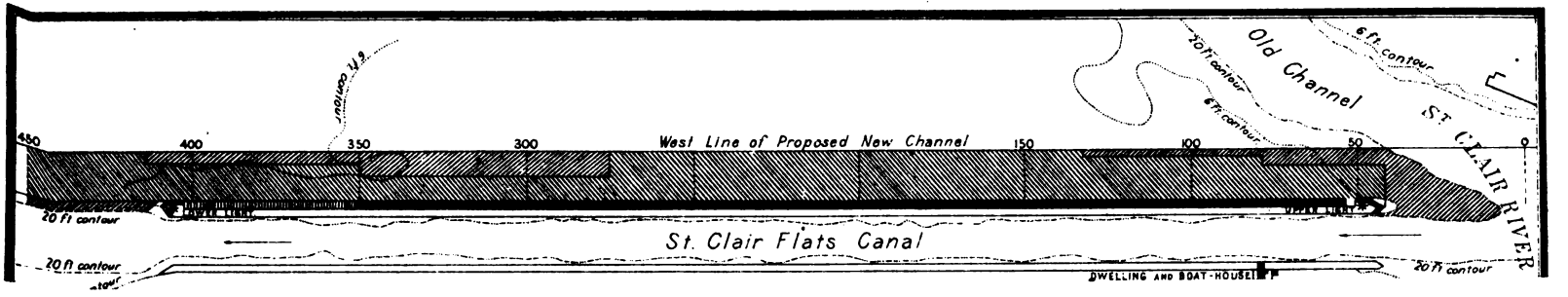
Money statement.

July 1, 1906, balance unexpended	$59,232.74
June 30, 1907, amount expended during fiscal year, for works of improvement	[a] 59,232.74

APPROPRIATIONS.

June 23, 1866	$80,000	March 3, 1879	$3,000
March 2, 1867	150,000	June 14, 1880	2,500
July 25, 1868	86,000	August 5, 1886	18,750
April 10, 1869	142,560	August 11, 1888	75,000
July 11, 1870	16,500	September 19, 1890	80,000
March 3, 1871	1,500	June 13, 1902	330,000
June 10, 1872	4,000		
March 3, 1873	100,000	Total	1,094,810
June 18, 1878	5,000		

[a] In addition to this amount, $86,491.28 were expended from the appropriation for "*Improving St. Marys River at the Falls.*"


450
400
350
300
West Line of Proposed New Channel
150
100
50
0
6 ft contour
20 ft contour
6 ft contour
Old Channel
6 ft contour
ST. CLAIR RIVER
20 ft contour
St. Clair Flats Canal
20 ft contour
20 ft contour
DWELLING AND BOAT-HOUSE

the west 300 feet of the 600-foot channel, involving the removal of about 140,000 cubic yards of limestone bed rock, all of which requires drilling and blasting. During the fiscal year three dredges, two drill boats, and two derrick scows were employed on the work, resulting in the removal of 37,789 cubic yards of full-rate material above 22-foot grade, 25,366 cubic yards of half-rate material between 22 and 24 foot grades, and 21,163 cubic yards of material for which no payment can be made, being below the 24-foot grade. The work required under this contract was completed on December 15, 1906.

At item B, Lime Kiln Crossing, work was commenced on May 24, 1907, under contract with Dunbar and Sullivan Dredging Company, which calls for the deepening of the east 300 feet of the 600-foot channel, involving the removal of about 140,000 cubic yards of limestone bed rock, all of which requires drilling and blasting. There were employed on the work one dredge and four drill boats, resulting in the removal of 1,205 cubic yards of full-rate material above 22-foot grade and 1,473 cubic yards of half-rate material between 22 and 24 foot grades, subject to revision by future surveys.

At section 3, Bois Blanc Island range, work was commenced on September 25, 1906, under contract with Dunbar and Sullivan Dredging Company, which calls for the deepening of the 600-foot channel near the head of Bois Blanc Island, involving the removal of about 314,000 cubic yards of earth and bowlders. Three dredges were employed on the work, resulting in the removal of 217,750 cubic yards of full-rate material above 22-foot grade, 42,870 cubic yards of half-rate material between 22 and 24 foot grades, and 30,540 cubic yards of material for which no payment can be made, being below the 24-foot grade, these figures being subject to revision by future surveys. At the end of the fiscal year about 85 per cent of the work had been completed.

At section 4, Amherstburg reach and Hackett range, work was continued under contract with M. Sullivan, which calls for the deepening of the 600-foot channel through Amherstburg reach and of the westerly half of the 600-foot channel through Hackett range, involving the removal of about 500,000 cubic yards of limestone bed rock, loose stones or bowlders, clay, and sand from an area of about 670,000 square yards. During the fiscal year one dredge, two drill boats, and two derrick boats were employed on the work, resulting in the removal of 7,921 cubic yards of full-rate material above 22-foot grade, 13,202 cubic yards of half-rate material between 22 and 24 foot grades, and 5,792 cubic yards of material for which no payment can be made, being below the 24-foot grade, these figures being subject to revision by future surveys. At the end of the fiscal year about 97 per cent of the work had been completed.

At Bar Point shoals work was continued under contract with G. H. Breymann & Bros., under which a minimum width of 400 feet to the west of the present 800-foot channel through this stretch is being deepened, involving the removal of about 1,450,000 cubic yards of sand, silt, clay, and small bowlders. During the fiscal year three dredges were employed on the work, resulting in the removal of 328,190 cubic yards. About 95 per cent of this work has been completed.

Plant operated by hired labor.—During July and August, 1906, the derrick scow with diving outfit belonging to the United States was

engaged in removing bowlders from the channel at various places between the south end of Fighting Island and Bar Point not covered by present contracts where this could be done without dredging. There were removed 125 cubic yards of bowlders from an area of about 25,000 square yards, at a cost of $1,220, being $9.75 per cubic yard.

The areas improved by the derrick scow and the areas improved under existing contracts have been examined from time to time by means of the sweeping raft, as a means of inspection, to determine that the required clear depth has been secured.

During April and May, 1907, the channel from Ballards reef to Bar Point was examined by means of the sweeping raft, and at various other times parts of this channel were so examined. This was done in order to locate and remove obstructions to navigation.

At various times, as the progress of the work has required, stakes have been driven in the water and ranges established on shore for the purpose of locating and controlling dredging operations under the several contracts.

All aids to navigation have been located by transit pointings from shore stations and their positions computed.

The tug service in connection with the operation of plant by hired labor was rendered under emergency contract with G. G. & F. H. Hackett, of Detroit, Mich., between July 1 and December 18, 1906, and under emergency contract with L. S. Sullivan, of Toledo, Ohio, between April 15 and June 30, 1907.

Surveys.—During August and September, 1906, observations were made to determine the discharge of that part of the Detroit River to the west of Grosse Isle. The cross section measured and along which observations were made was about 850 feet south of the Michigan Central Railroad bridge. The volume of water discharged was found to be 50,148 cubic feet per second at a Lake Erie stage of 573.45 feet, or about 22 per cent of the total discharge of the river.

At various times between July 1 and December 15, 1906, and between May 1 and June 30, 1907, surveys were made by means of boats and sounding raft for the purpose of determining the amounts of material removed under existing contracts and to be removed in making proposed improvements. The number of soundings taken was 103,100, at a cost of $3,100, being 3 cents per sounding.

During January and February, 1907, an ice survey was made to determine the amounts of material removed under existing contracts. The number of soundings taken was 151,300, at a cost of $2,350, being 1.6 cents per sounding.

Present condition of the channel.—As a result of all improvements, depths being referred to a Lake Erie stage of 570.8 feet above mean tide at New York, the present condition of the channel is as follows:

From Detroit to about 1 mile south of Fighting Island there is a clear depth of 21 feet for a width of 600 feet or more; thence to the north end of Lime Kiln Crossing there is a clear depth of 19.2 feet for the same width. The full width of channel is now in use.

Along the Lime Kiln Crossing range for a distance of 3,500 feet at the north end there is 21 feet depth for the west 300 feet, which is now in use by downbound vessels, and there is 17 feet depth for the east 300 feet, a part of which is in use by upbound vessels, with work in progress providing for the deepening of all of it to 21 feet. For

a distance of 2,500 feet at the south end of this range there is 19 feet depth for the entire 600 feet width, all of which is in use, with work in progress and nearing completion providing for 21 feet depth.

Throughout Amherstburg reach there is 20 feet depth for the entire 600 feet width, all of which is in use, with work in progress and nearing completion providing for 21 feet depth.

Along Hackett range to about 1½ miles south of Bois Blanc Island there is a clear depth of 18.5 feet for from 500 to 600 feet width, with work in progress and nearing completion providing for a deepening to 21 feet for a width of 600 feet and length of 2,000 feet at the north end and for the west 300 feet throughout the southern portion. The entire width of the channel is now in use.

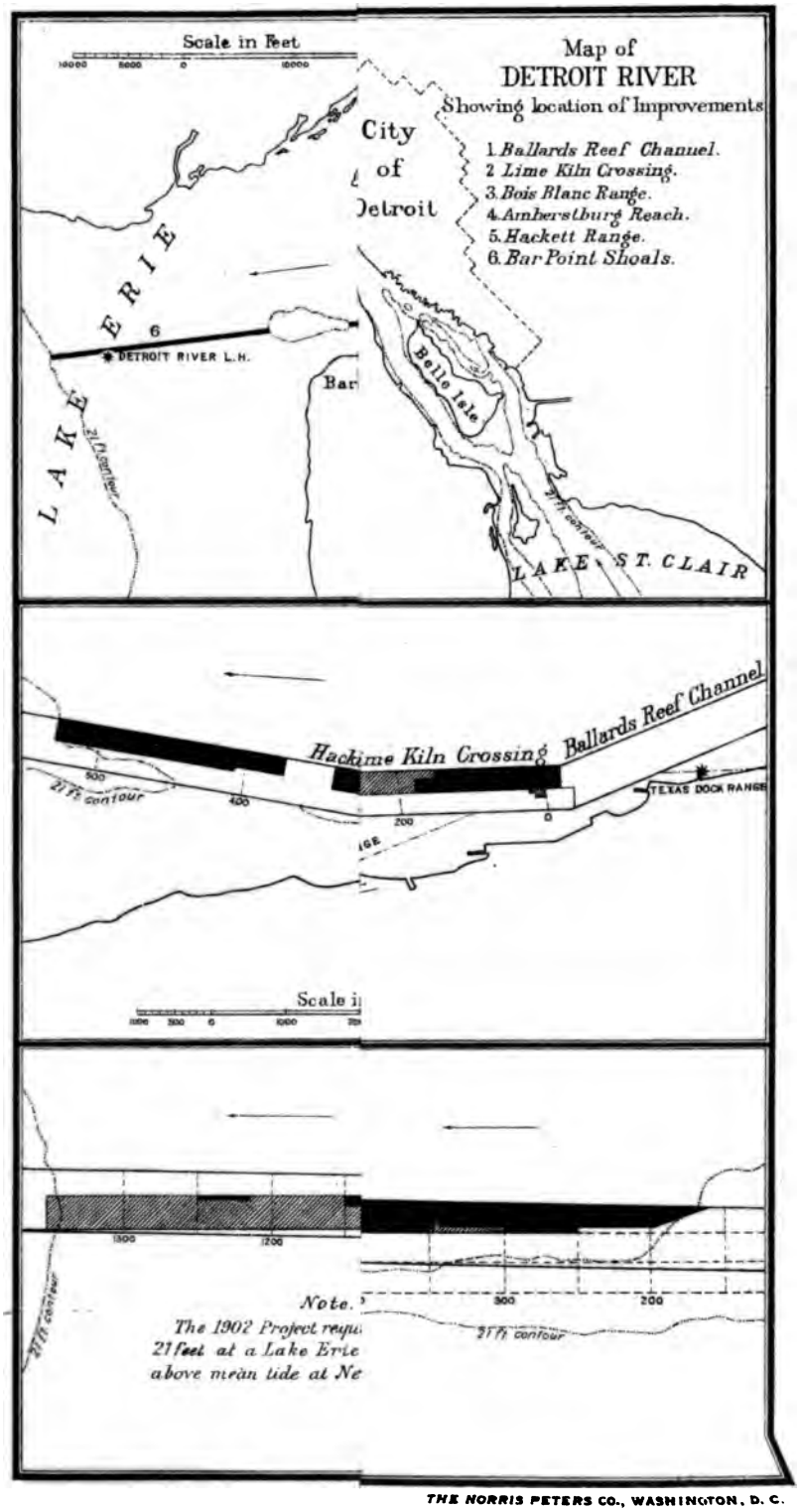
From about 1½ miles south of Bois Blanc Island to about 1 mile south of Bar Point there is a clear depth of 21 feet for a width of 600 feet or more; thence to Detroit River light-house, through Bar Point shoals, there is a clear depth of 18.2 feet for a width of 800 feet, 400 feet each side of the sailing line. The full width of channel is in use.

Also, at Bar Point shoals, there is work in progress and nearing completion providing for a deepening to 21 feet for an additional 400 feet or more of width to the westward, extending from 14,000 feet north to 11,000 feet south from the Detroit River light-house.

Groundings and collisions.—During the year many vessels went aground on the sides of the channel at the mouth of Detroit River, and still others were injured by striking bowlders or pieces of rock, but were not detained. The accidents which resulted most seriously to the vessel interests were as follows: On June 15, 1907, the barge *Montezuma* went aground on the east bank of Lime Kiln Crossing, completely blocking the channel for upbound vessels until the barge was released by lightering about ten days later. During this time all upbound vessels used the 300-foot channel to the westward, which at other times was used almost entirely by downbound vessels. Also, on the night of May 12, 1907, the steamer *Byron Whitaker* was sunk in midchannel near the head of Bois Blanc Island on account of collision with the steamer *John C. Gault*. The sunken steamer partially obstructed navigation and was removed intact on May 22, 1907.

Water-gauge readings.—The permanent automatic water gauge at the mouth of the Detroit River was attended to regularly during the year, and the record derived therefrom has been reduced. The following table gives the elevation of the stage of water for the several months.

Month.	1. Mean stage.	2. Maximum stage.	3. Minimum stage.	4. Mean depth.	5. Maximum depth.	6. Minimum depth.
1906.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
July	573.00	573.88	572.08	19.20	20.08	18.28
August	572.97	574.38	572.13	19.17	20.58	18.33
September	572.69	573.60	571.61	18.89	19.80	17.81
October	572.38	573.80	568.48	18.58	20.00	14.68
November	572.32	573.52	568.89	18.52	19.72	15.09
December	572.54	573.70	569.72	18.74	19.90	15.92
1907.						
January	572.88	574.43	568.46	19.08	20.63	14.66
February	572.67	573.42	570.11	18.87	19.62	16.91
March	572.45	573.36	570.63	18.65	19.56	16.83
April	572.94	574.44	571.07	19.14	20.64	17.27
May	573.17	574.11	570.70	19.37	20.31	16.90
June	573.62	574.47	572.21	19.82	20.67	18.41



THE NORRIS PETERS CO., WASHINGTON, D. C.

In the above table, columns 1, 2, and 3 give elevations above mean tide at New York, levels of 1903, and columns 4, 5, and 6 give the depths at Lime Kiln Crossing, this being the place of least depth in the channel of lower Detroit River up to April, 1907. Since April, 1907, the least depth for downbound vessels has been at Bar Point shoals, and for such time one foot should be added to the depths given in the above table. During 1907, the least depth for upbound vessels has continued to be at Lime Kiln Crossing.

The highest stage during the year was 574.47 (20.67 feet depth) on June 10, 1907; and the lowest stage was 568.46 (14.66 feet depth) on January 20, 1907, the extreme yearly fluctuation being 6.01 feet. The month of greatest fluctuation was January, 1907 (5.97 feet), and the month of least fluctuation was July, 1906 (1.80 feet). The greatest fluctuations during a short period of time were as follows: 4.82 feet in fifteen hours on October 27, 1906; 4.59 feet in ten hours on November 21–22, 1906; 3.56 feet in seven hours on December 6, 1906; 4.68 feet in eleven hours on January 20, 1907; and 3.03 feet in nine hours on May 27, 1907.

The supervision of this work has been in charge of Assistant Engineer Chas. Y. Dixon.

The commerce passing through the Detroit River during the calendar year of 1906 amounted to 63,808,571 tons, as shown in the Commercial Statistics appended hereto.

Money statement.

[For detailed money statements see page 697.]

July 1, 1906, balance unexpended		$942,245.53
Amount appropriated by river and harbor act approved March 2, 1907	Plan A	150,000.00
	Plan B	2,000,000.00
		3,092,245.53
June 30, 1907, amount expended during fiscal year, for works of improvement		[a] 425,594.73
July 1, 1907, balance unexpended		2,666,650.80
July 1, 1907, outstanding liabilities		201,570.00
July 1, 1907, balance available		2,465,080.80
July 1, 1907, amount covered by uncompleted contracts		400,600.00
Amount (estimated) required for completion of existing project	Plan A	1,450,000.00
	Plan B	4,670,950.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement, Plan A	$150,000.00	
For works of improvement, Plan B	1,500,000.00	
		1,650,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

[a] Includes $0.59 paid by Treasury Department, account of Lake Shore and Michigan Southern Railway Company.

APPROPRIATIONS.

June 23, 1874	$25,000	March 3, 1899	$100,000
June 18, 1878	100,000	June 6, 1900	200,000
March 3, 1879	50,000	March 3, 1901	325,000
June 14, 1880	50,000	June 13, 1902	500,000
March 3, 1881	50,000	June 28, 1902	136,500
August 2, 1882	60,000	March 3, 1903	450,000
July 5, 1884	200,000	March 3, 1905	500,000
August 5, 1886	37,500	June 30, 1906	700,000
August 11, 1888	130,500	March 2, 1907	150,000
July 13, 1892	30,000		2,000,000
August 18, 1894	30,000		
June 3, 1896	30,000	Total	5,854,500

CONTRACTS IN FORCE.

CONTRACT DATED APRIL 5, 1904.

Name of contractor: G. H. Breymann & Bro., Toledo, Ohio.
Amount and character of work: $430,625 (estimated); dredging section 2, Lime Kiln Crossing.
Price per unit: $3.25 per cubic yard, bank measurement (full rate), and $1.625 per cubic yard, bank measurement (half rate).
Date of approval: April 14, 1904.
Date of beginning work: June 20, 1904.
Date of expiration: About July 7, 1906 (400 good working days).
Date of completion: December 15, 1906.

CONTRACT DATED MAY 31, 1904.

Name of contractor: M. Sullivan, Buffalo, N. Y.
Amount and character of work: $804,000 (estimated); dredging section 4, Amherstburg Reach and Hackett Range.
Price per unit: $2.40 per cubic yard, bank measurement (full rate), and $1.20 per cubic yard, bank measurement (half rate).
Date of approval: June 13, 1904.
Date of beginning work: August 15, 1904.
Date of expiration: About July 31, 1907 (500 good working days).

CONTRACT DATED MARCH 2, 1905.

Name of contractor: G. H. Breymann & Bros., Toledo, Ohio.
Amount and character of work: $324,000 (estimated); dredging Bar Point shoals.
Price per unit: 27 cents per cubic yard, scow measurement.
Date of approval: March 17, 1905.
Date of beginning work: May 20, 1905.
Date of expiration: About August 31, 1907 (400 good working days).

CONTRACT DATED OCTOBER 1, 1906.

Name of contractor: Dunbar & Sullivan Dredging Company, Buffalo, N. Y.
Amount and character of work: $54,000 (estimated); dredging at section 3, Bois Blanc Island range.
Price per unit: 19⅞ cents per cubic yard, bank measurement (full rate), and 9 15/16 cents per cubic yard, bank measurement (half rate).
Date of approval: October 17, 1906.
Date of beginning work: April 16, 1907.
Date of expiration: About October 10, 1907 (150 good working days).

CONTRACT DATED MARCH 29, 1907.

Name of contractor: Dunbar & Sullivan Dredging Company, Buffalo, N. Y.
Amount and character of work: $384,000 (estimated); dredging at Item B, Lime Kiln Crossing.
Price per unit: $3.80 per cubic yard, bank measurement (full rate), and $1.90 per cubic yard, bank measurement (half rate).
Date of approval: April 19, 1907.
Date of beginning work: June 19, 1907.
Date of expiration: About June 10, 1909 (375 good working days).

EMERGENCY CONTRACT DATED APRIL 9, 1906.

Name of contractors: G. G. Hackett and F. H. Hackett, Detroit, Mich.
Amount and character of work: $3,750 (estimated); hire of tug *S. J. Christian.*
Price per unit: $25 per day.
Date of beginning work: April 19, 1906.
Date of expiration: About October 19, 1906.
Date of completion: December 18, 1906.

EMERGENCY CONTRACT DATED APRIL 1, 1907.

Name of contractors: G. G. Hackett and F. H. Hackett, Detroit, Mich.
Amount and character of work: $300; hire of tug *S. J. Christian.*
Price per unit: $25 per day.
Date of beginning work: April 1, 1907.
Date of expiration and completion: April 13, 1907.

EMERGENCY CONTRACT DATED APRIL 10, 1907.

Name of contractor: L. S. Sullivan, Toledo, Ohio.
Amount and character of work: $4,900 (estimated); hire of tug *Pallister.*
Price per unit: $25 per day.
Date of beginning work: April 15, 1907.
Date of expiration: About December 5, 1907 (end of season).

COMMERCIAL STATISTICS.

STATISTICS OF LAKE COMMERCE PASSING THROUGH THE DETROIT RIVER, MICHIGAN, DURING THE SEASON OF 1906.

[Compiled from official records at Detroit, Mich.]

SOURCES OF INFORMATION FOR TRAFFIC DATA AND VALUATIONS.

The number and class of vessels and the number of passages have been taken from the custom-house and post-office records at Detroit. The registered tonnage is taken from the American and Canadian "blue books." The determination of the actual freight carried is based upon the assumption that the ratio between actual freight and registered tonnage is the same for Detroit River that it is for St. Marys Falls Canals. The valuation of the freight is based upon the assumption that the value of freight passing the Detroit River is the same per ton as that passing St. Marys Falls Canals. The valuation of the vessels was taken from Lloyds' Register.

The total freight traffic through the Detroit River for the season of 1906 when compared with the season of 1905 shows an increase of 4,761,275 tons. In normal years the commerce of Detroit River exceeds that of St. Marys Falls Canal by about one-fourth. During the years 1903 and 1904 the excess was about one-third, but these two years were marked by a considerable diminution of traffic. The mean excess for the past six years is 28 per cent.

The following compilation has been made from data similar to those used since 1902, viz, the marine post-office record of vessels passing through the Detroit River and the custom-house record of vessels stopping at Detroit. The Detroit postmaster, Mr. Homer Warren, has permitted the record of vessels passing Detroit River to be copied, while the record of those stopping was obtained from the collectors of customs at Detroit, Windsor, and Amherstburg.

After the lists were completed the net registered tonnage was copied from the American and Canadian "blue books" and summed. The ferryboats plying between Detroit, Windsor, and Belle Isle and the dredging plants at Amherstburg and Detroit are not included.

The passages are collected and summed as follows:

Month.	Vessels.	Net registered tonnage.	Month.	Vessels.	Net registered tonnage.
1906.			1906.		
January	119	8,895	August	5,122	7,296,482
February	6	66	September	4,490	6,925,230
March	149	49,804	October	4,207	6,839,236
April	2,232	2,646,887	November	3,543	5,427,012
May	3,999	5,445,279	December	1,128	1,567,151
June	4,768	6,983,710			
July	5,365	7,484,195	Total	35,128	50,673,897

The actual freight is obtained by comparison with the tonnage of St. Marys Falls Canals, where records of both net registered and actual freight are kept. During the season of 1905 the actual freight passing St. Marys Falls Canals was 25.92 per cent greater than the net registered tonnage. Assuming this ratio for the commerce of Detroit River, the actual freight would be 63,808,571 tons of 2,000 pounds each. The commerce using the St. Clair Flats Canal is less than that of the Detroit River. It is found from the customs-house records that 2,581,488 net registered tons that used the Detroit River do not go through the canal but turn around and go back down the river. This should be subtracted from the Detroit River tonnage. There is a small amount of business done at Lake St. Clair ports which does not go through the Detroit River, of which we have no actual record, but which is estimated by the custodian to aggregate 25,000 net registered tons during the season. This should be added to the Detroit River tonnage. Making the corrections, the commerce using the St. Clair Flats Canal during the season of 1906 is found to be 48,117,409 net registered tons, or 60,589,441 actual freight tons. The value of the freight passing St. Marys Falls Canals during the season of 1906 was found to be $10.39 per ton. Assuming this unit value for the Detroit River commerce, then the total value of actual freight passing Detroit River during the season of 1906 would be $662,971,053. The commerce passing Detroit River has now been determined with accuracy for five consecutive years as follows:

Year.	No. of passages.	Net registered tons.	Actual freight.	Value.
1902	33,000	39,328,689	44,260,506	$440,834,640
1903	33,113	37,453,796	46,817,245	471,917,830
1904	29,472	33,049,984	42,792,326	453,598,656
1905	35,599	45,912,622	55,508,360	522,888,751
1906	35,128	50,673,897	63,808,571	662,971,053

The actual freight is 4,761,275 tons greater than in 1905. The number of vessel passages has decreased 410. There were 881 steam vessels that used the Detroit River during the season of 1906; of these there were 776 the registered tonnage of which exceeded 100 tons. The average tonnage of these 776 large steam vessels was 1896 net registered tons. There were 276 sail vessels having a tonnage greater than 100 tons. Their average tonnage was 921 tons.

GENERAL SUMMARY FOR DETROIT RIVER.

Total net registered tons	50,673,897
Actual freight carried	63,808,571
Valuation placed on freight	$662,971,053
Total number of vessels	1,175
Number of American vessels	1,061
Number of Canadian vessels	114
Number of steam vessels	881
Number of sail vessels	294
Valuation of steam vessels	97,870,000
Valuation of sail vessels	$8,353,000
Total valuation of vessels	$106,223,000

ST. CLAIR FLATS CANAL.

Total net registered tons	48,117,409
Actual freight	60,589,441

P P 8.

REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

Wreck of steamer Linden.—This vessel was sunk June 23, 1905, while in collision with the steamer *City of Rome.* The collision occurred in the St. Clair River at a point about 1 mile above Tashmoo Park. After the failure of the Myers Wrecking Company, contractors, to remove the wreck, their bond of $500 was forfeited and a second contract was made with the Port Huron Transportation and Wrecking Company, who agreed to remove the wreck for the title to vessel and cargo. These contractors succeeded in lifting the wreck, but while proceeding downstream with it one of the pontons sank and the wreck again settled on the bottom, but out of the regular track of vessels. During the fiscal year the contractors were granted an extension of time in order to complete their contract, but at the close of the year they had only succeeded in removing part of the cargo of coal.

Wreck of tug Fannie Tuthill.—This tug was sunk October 1, 1905, in the channel through Lake St. Clair, about 2 miles below the canal. The work of removal was completed under contract in July, 1906, at a total cost of $535.90.

Wreck of schooner City of Toledo.—This vessel was sunk July 21, 1906, in the Detroit River, about 3,700 feet above Belle Isle bridge. Its removal was completed under contract in November, 1906, at a total cost of $2,300.

Wreck of steamer Nelson Mills.—This steamer was sunk on September 6, 1906, in the St. Clair River, about a mile and three-quarters below the town of St. Clair. Its removal was completed under contract during November, 1906, at a total cost of $1,000.

Wreck of steamer Eliza H. Strong.—In October, 1904, this steamer sank in Lake Huron, 4,433 feet from the southeast corner of the dock at Lexington, Mich., while being towed from that point to Port Huron. As the wreck was an obstruction to vessels doing a coasting business its removal was deemed essential, and an allotment of $1,000 for that purpose was made on June 28, 1905. Shortly after this the underwriters who had charge of the wreck stated that they had entered into contract to remove it.

It is understood that the boilers and machinery have been removed, and that the contractors are only waiting for favorable weather to blow up the hull with dynamite. The amount expended, $57.97, represents the cost of examination of the wreck.

Wreck of barge Checotah.—On November 19, 1906, report was received that the master of the steamer *W. H. Mather* had sighted, at a point 19 miles south from Harbor Beach, Lake Huron, and in the track usually traveled by the larger class of vessels, a spar projecting above the water surface, which spar he assumed to be a part of the

wreck of the barge *Checotah*, which was wrecked near this place earlier in the season. The Government tug *Johnson*, stationed at the harbor of refuge at Harbor Beach, was directed to proceed to the point described for the purpose of examining the wreck, and upon investigation it was found that the wreck itself lay in water over 20 fathoms deep, but that the spar projecting above the water's surface was afloat and attached to the wreck by means of the rigging. The spar was removed and towed to a place of safety at Harbor Beach. The total cost of the work was $37.85.

Wreck of steamer New Orleans.—The master of the light-house tender *Amaranth*, on July 5, 1906, reported finding the after cabin deck of the steamer *New Orleans* afloat in the vicinity of Thunder Bay Island, Michigan, Lake Huron. As the wreck was dangerously near the track of vessels doing a coastwise business along the shore of the lake the Government tug *Johnson*, stationed at Harbor Beach, Mich., was directed to proceed to the ascertained location. On the morning of July 8 the wreck was found afloat in 31 feet of water, 30 feet of the after cabin of the vessel being visible above the water surface. The tug took this wreckage in tow and removed it well from the usual track of navigation, beaching it in shallow water at Crooked Island, 7½ miles to the northwest of the spot where the wreck was found. Soundings failed to locate any other portion of the wreck of the vessel. The total cost of the work was $41.25.

Unknown wreck in Lake Huron.—During June, 1907, the U. S. Lake Survey steamer *Search* reported the discovery of what appeared to be a schooner or barge with deck and upper works gone, lying in about 30 feet of water, but with only 19½ feet over it, near Thunder Bay Island light-house, Lake Huron. An allotment of $1,000 was requested for its removal.

CONTRACTS IN FORCE.

EMERGENCY CONTRACT DATED NOVEMBER 21, 1905.

Name of contractor: Port Huron Transportation and Wrecking Company, Port Huron, Mich.
Amount and character of work: Title to vessel and cargo; removal of wreck steamer *Linden*.
Price: Title to vessel and cargo.
Date of beginning of work: December 1, 1905.
Date of expiration: Indefinite (as extended).

EMERGENCY CONTRACT DATED OCTOBER 20, 1905.

Name of contractor: The Reid Wrecking Company, Port Huron, Mich.
Amount and character of work: $450; removal of wreck tug *Fannie Tuthill*.
Price: Lump sum of $450.
Date of beginning of work: October 30, 1905.
Date of completion: July, 1906.

EMERGENCY CONTRACT DATED NOVEMBER 3, 1906.

Name of contractor: Harris W. Baker, Detroit, Mich.
Amount and character of work: $950; removal of wreck steamer *Nelson Mills*.
Price: $950.
Date of beginning of work: November 3, 1906.
Date of completion: November 10, 1906.

EMERGENCY CONTRACT DATED NOVEMBER 14, 1906.

Name of contractor: Harris W. Baker, Detroit, Mich.
Amount and character of work: $2,300; removal of wreck schooner *City of Toledo.*
Price: $2,300.
Date of beginning of work: November 14, 1906.
Date of completion: November 28, 1906.

GENERAL REMARKS.

The large appropriations, going well up into the millions, that have been made for the improvement of the main thoroughfare through the Great Lakes, commonly designated the Ship Channel, which includes the improvements of the St. Marys River, the St. Clair Flats, and the Detroit River, impress the popular mind strongly, and the question is often asked if such great expenditures of public moneys are warranted by the requirements of the situation.

The following table of freight valuations is compiled from the Statistical Report of Lake Commerce passing through the canals at Sault Ste. Marie, Michigan and Ontario during the season of 1906:

Year.	Valuation.	Year.	Valuation.
1887	$79,031,757	1898	$233,069,740
1888	82,156,019	1899	281,364,750
1889	83,732,527	1900	267,041,959
1890	102,214,948	1901	298,906,865
1891	128,178,208	1902	358,306,300
1892	135,117,267	1903	349,405,014
1893	145,436,957	1904	334,502,686
1894	143,114,502	1905	416,965,484
1895	159,575,129	1906	537,463,454
1896	195,146,842		
1897	218,235,927	Total	4,548,966,335

That is for a period of twenty years—from 1887 to 1906, inclusive—the valuation of the freight tonnage reaches the enormous total of over four and one-half billion of dollars, having already passed the half billion mark per annum. Taking the ratio between the commerce passing through the Detroit River and St. Marys River and applying it to the valuations, the total through the latter river for the same twenty-year period amounts to $5,611,234,000 in round numbers.

For the same twenty-year period the total amounts expended were as follows:

Ship channel	$3,259,504
St. Marys River	4,202,210
Operating and care, St. Marys Falls Canal	1,258,105
Hay Lake and Neebish channels	4,575,655
St. Clair Flats Canal	425,767
Operating and care St. Clair Flats Canal	112,185
Detroit River	2,189,815
Total	16,023,241

This total amounts to a little over two and eight-tenths of 1 per cent of the total freight values, which would seem to answer the question of whether the expenditure is justified.

It is to be borne in mind that this great commerce has actually been created by these improvements, to say nothing of the great iron, coal, and ship-building industries that have been established as a result of these improvements, giving employment to thousands of men.

APPENDIX Q Q.

IMPROVEMENT OF RIVERS AND HARBORS ON LAKE ERIE, IN THE STATE OF OHIO.

REPORT OF LIEUT. COL. C. McD. TOWNSEND, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Toledo Harbor, Ohio.
2. Port Clinton Harbor, Ohio.
3. Sandusky Harbor, Ohio.
4. Huron Harbor, Ohio.
5. Vermilion Harbor, Ohio.
6. Lorain Harbor, Ohio.
7. Cleveland Harbor, Ohio.
8. Fairport Harbor, Ohio.
9. Ashtabula Harbor, Ohio.
10. Conneaut Harbor, Ohio.
11. Removing sunken vessels or craft obstructing or endangering navigation.

ENGINEER OFFICE, UNITED STATES ARMY,
Cleveland, Ohio, July 9, 1907.

GENERAL: I have the honor to forward herewith annual reports for works in my charge for fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

C. McD. TOWNSEND,
Lieut. Col., Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

Q Q 1.

IMPROVEMENT OF TOLEDO HARBOR, OHIO.

For an account of early history and projects of improvements, see pages 2614 to 2616, Report of Chief of Engineers, 1898, and for latest projects see pages 3020 and 3021, Report of Chief of Engineers, 1899.

For a statement and estimate of cost of the project of 1899 and maps showing the limits of "divisions" into which the work is separated see Report of Chief of Engineers, 1898, pages 2693 to 2705. An accurate map of the harbor of Toledo was published in the Report of Chief of Engineers, 1901.

The work of excavating the straight channel under the continuous contract with the Lydon & Drews Company was completed October

9, 1905. The construction of the dike connecting the range lights in the bay was completed under same contract September 2, 1906.

The following is a tabulated statement of the work done during the fiscal year as well as the total work done under this contract:

	Contract price.	Fiscal year, 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Dredging.					
Outer division.....cubic yards..	$0.09½	.....	.....	1,882,719	$176,504.91
Middle division.....do....	.08	.....	.....	1,677,318	134,185.04
Inner division.....do....	.08	.....	.....	1,933,587	154,686.96
River division.....do....	.09½	.....	.....	360,837	33,828.47
Logging.....	.....	.....	.....	.....	260.37
Constructing dike.					
Mattress.....square yards..	.50	.....	.....	5,452.06	2,726.03
Wall stone.....tons..	1.10	.....	.....	22,443.36	24,687.70
Cap stone.....do....	1.60	626.93	$1,003.09	1,098.83	1,750.13
Earth filling.....cubic yards..	.60	5,436.5	3,261.90	9,116.5	5,469.90
Soil filling.....do....	1.40	1,177.0	1,647.80	1,177	1,647.80
Board of inspectors.					
Per day per man.....	.50	.....	.....	4,941¼	2,470.63
Total.....	.....	.....	5,912.79	.....	538,217.94

The U. S. dredge *Maumee* worked at Toledo from July 1 to September 10, excavating 2,718 cubic yards at the Lake Shore Railway Bridge and 51,301 cubic yards from Division A, above the Fassett Street Bridge. The cost of this work was $4,109.08.

During the winter months the dredge *Maumee*, tug *Spear*, and scows were thoroughly overhauled at Port Clinton at a cost of $5,765.81, and the U. S. dredge *Burton* was overhauled at Sandusky at a cost of $5,207.47, which amounts include all expenses during the winter months.

Two 500-cubic yard dump scows for use in connection with the dredge *Maumee* are being constructed at Port Clinton, at an estimated cost of $25,000. Work was commenced on the scows April 1 and $16,129.02 has been expended for labor and materials.

There has been a continuous shoaling in the dredged channels, and the U. S. dredge *Burton* worked at Toledo on maintenance work from June 22 to December 14, 1906, and from June 4 to 30, 1907, removing 48,096 cubic yards from the river channel between Magnolia and Ash streets and 195,801 cubic yards from the inner division of the Straight Channel, all at a cost of $27,239.19.

The following is a statement of expenditures made on account of improving harbor at Toledo, Ohio, during the fiscal year 1907:

General administration:		
Office and engineering	$1,327.75	
Travel and miscellaneous	262.82	
Care and repair of Government storehouse	635.06	
Advertising	10.98	
Purchase and repair of plant	918.13	
		$3,154.74
Dredging channels (U. S. dredge *Maumee* and fleet):		
Services	7,046.95	
Supplies	2,014.27	
Repairs	2,910.72	
Subsistence	1,030.99	
		13,002.93

Dredging channels (U. S. dredge *Burton*):		
Services	$8,956.55	
Supplies	6,401.60	
Repairs	554.14	
Subsistence	1,878.94	
		$17,791.23
Steamer *Visitor:*		
Services	190.99	
Supplies	106.96	
Repairs	798.34	
Subsistence	200.12	
		1,296.41
Construction of new dump scows:		
Services	1,694.17	
Materials	7,493.83	
		9,188.00
Dredging and constructing dike (the Lydon & Drews Co.):		
Paid to contractor	26,482.20	
Inspection	518.33	
		27,000.53
Total expended		71,433.84

Money statement.

July 1, 1906, balance unexpended		$183,377.33
Receipts from sales		1,683.44
		185,060.77
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$52,089.42	
For maintenance of improvement	19,344.42	
		71,433.84
July 1, 1907, balance unexpended		113,626.93
July 1, 1907, outstanding liabilities		11,066.12
July 1, 1907, balance available		102,560.81
July 1, 1907, amount covered by uncompleted contracts		1,388.85

APPROPRIATIONS.

OLD CHANNEL.

June 23, 1866	$20,000.00	March 3, 1879	$20,000.00
March 2, 1867	20,000.00	June 14, 1880	30,000.00
April 10, 1869	29,700.00	March 3, 1881	40,000.00
July 11, 1870	50,000.00	August 2, 1882	50,000.00
March 3, 1871	50,000.00	July 5, 1884	20,000.00
June 10, 1872	15,000.00	August 5, 1886 (see note)	9,632.61
March 3, 1873	100,000.00	August 11, 1888	5,000.00
June 23, 1874	75,000.00	September 19, 1890	5,000.00
March 3, 1875	75,000.00		
August 14, 1876	60,000.00	Total for old channel	724,332.61
March 18, 1878	50,000.00		

STRAIGHT CHANNEL.

July 5, 1884	$25,000.00	June 28, 1902	$223,000.00
Deduct amount appropriated for old channel (see note)	9,632.61	March 3, 1903	190,000.00
		April 28, 1904	70,000.00
		March 3, 1905	20,000.00
		March 3, 1905	161,000.00
	15,367.39		
August 5, 1886	112,500.00	Total for straight channel	1,869,436.14
August 11, 1888	150,000.00		
September 19, 1890	200,000.00		
July 13, 1892	200,000.00	Total of all appropriations for Toledo Harbor, Ohio	2,593,768.75
August 18, 1894	70,000.00		
June 3, 1896	150,000.00	Expended to June 30, 1907	2,480,141.82
March 3, 1899	150,000.00		
June 6, 1900	132,500.00	Total	113,626.93
March 3, 1901	8,000.00		
June 13, 1902	15,000.00		

NOTE.—By act of August 5, 1886, the balance then available of the $25,000 appropriated July 5, 1884, for straight channel was made available for clearing the old channel.

CONTRACT IN FORCE.

CONTRACT FOR DREDGING IN STRAIGHT CHANNEL THROUGH MAUMEE RIVER AND BAY, AND FOR CONSTRUCTING A DIKE BETWEEN TURN-OUT CHANNELS, TOLEDO HARBOR, OHIO.

Name of contractor: The Lydon & Drews Company, Chicago, Ill.
Date of contract: July 21, 1899.
Date of approval: September 23, 1899.
Date of commencement: May 1, 1900.
Date of completion: September 30, 1906.

COMMERCIAL STATISTICS.

The following statistics for the year 1906 relative to the commerce of the harbor of Toledo, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Coal and coke	25,422	Coal and coke	2,325,259
Fish	800	Grain and produce	6,160
Grain and produce	40,448	Iron ore	4,000
Iron ore	1,781,131	Iron, pig and manufacturing	314
Iron, pig	1,251	Lumber, logs, etc	6,331
Iron, manufacturing	280	Stone, lime, and sand	4,500
Lumber, logs, etc	108,736	Miscellaneous	16,625
Salt	28,670		
Stone, lime, and sand	150,000		
Miscellaneous	22,353		
Total	2,159,091	Total	2,363,189

Total freight tonnage:	
1906	4,522,280
1905	3,613,389
Increase	908,891

Vessels.	Number.	Tonnage.
Entering	1,681	1,558,406
Departing	1,705	1,734,053
Built	2	6,801

Total registered tonnage (vessels entering and departing):	
1906	3,292,459
1905	3,840,820
Decrease	548,361

Draft of largest vessels using harbor, 24 feet.
Largest vessels do not load to full depth.
No new vessel lines established during the year.

Q Q 2.

IMPROVEMENT OF PORT CLINTON HARBOR, OHIO.

The location and early history of this work are given upon pages 2647 and 2648, Report of Chief of Engineers, 1898.

The funds available at the beginning of the present fiscal year amounted to only $1,859.97.

The contract with The Buckeye Contracting Company, of Cleveland, Ohio, for placing riprap along unprotected portions of the jetties was completed during the year.

The following statement shows the materials used and cost of same:

802.08 tons riprap stone, at $1.45	$1,163.02
402.75 tons core stone, at $1.28	515.52
18.25 cubic yards stone gathered, at 25 cents	9.13
Total	1,687.67

A storehouse and ways for the repair of Government vessels and plant has been established on the land owned by the United States at Port Clinton. The U. S. dredge *Maumee*, tug *Spear*, and scows were overhauled there last winter, and work is now in progress on two 500-cubic-yard dump scows. The cost of this work is charged to the appropriation for Toledo Harbor.

The following is a statement of expenditures made on account of improving harbor at Port Clinton, Ohio, during the fiscal year 1907:

General administration:		
Travel and miscellaneous		$5.63
Repair of jetties (The Buckeye Contracting Company):		
Paid to contractor	$1,687.67	
Inspection	166.67	
		1,854.34
Total expended		1,859.97

Money statement.

July 1, 1906, balance unexpended	$1,859.97
Amount appropriated by river and harbor act approved March 2, 1907	3,000.00
	4,859.97
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,859.97
July 1, 1907, balance unexpended	3,000.00
July 1, 1907, outstanding liabilities	45.94
July 1, 1907, balance available	2,954.06
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	2,500.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

July 10, 1872	$8,000	July 13, 1892	$10,000
July 10, 1872 (allotment)	2,000	August 18, 1894	6,000
March 3, 1875	5,000	June 3, 1896	6,000
August 14, 1876	5,000	March 3, 1899	6,000
June 18, 1878	10,000	June 13, 1902	5,000
March 3, 1879	10,000	March 3, 1905	2,000
June 14, 1880	5,000	March 2, 1907	3,000
March 3, 1881	5,000		
August 2, 1882	6,000	Total	104,000
August 5, 1886	2,000	Expended to June 30, 1907	101,000
August 11, 1888	5,000		
September 19, 1890	3,000		3,000

NOTE.—The river and harbor act of July 13, 1892, provided "that of the amount, $1,200 are to be paid to Charles Roose, of Oak Harbor, Ohio, in full satisfaction for the necessary portion of the sand beach adjoining the inner end of the west revetment of Port Clinton Harbor."

CONTRACT IN FORCE.

Contract for stone reenforcement and repair of jetties at Port Clinton Harbor, Ohio.

Name of contractor: The Buckeye Contracting Company, Cleveland, Ohio.
Date of contract: June 20, 1905.
Date of approval: July 3, 1905.
Date of commencement: July 5, 1905.
Date of completion: November 30, 1906.

COMMERCIAL STATISTICS.

The following statistics for the year 1906 relative to the commerce of the harbor of Port Clinton, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Fish	4,000	Coal and coke	30
Grain and produce	225	Lumber, logs, etc	275
Lumber, logs, etc	5,724	Miscellaneous	588
Stone, lime, and sand	480		
Miscellaneous	608		
Total	11,037	Total	893

Total freight tonnage:	
1906	11,930
1905	13,382
Decrease	1,452

Vessels.	Number.	Tonnage.
Entering	55	7,739
Departing	56	8,396

Total registered tonnage:	
1906	16,135
1905	14,544
Increase	1,591

Draft of largest vessels using harbor, 12 feet.
Largest vessels do not load to full depth.
No new vessel lines established during the year.

Q Q 3.

IMPROVEMENT OF SANDUSKY HARBOR, OHIO.

A description of location and various projects of improvement, with results obtained, is given upon page 2650, Report of Chief of Engineers, 1898.

Under contract with the Great Lakes Dredge and Dock Company, of Chicago, Ill., dated June 14, 1905, the following work has been performed:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Straight channel.					
Dredging.....cubic yard..	$0.104	56,479	$5,873.82	1,011,217	$105,166.57
Logging.....hours..	.....	.....	.....	1:25	45.65
East dock channel.					
Dredging.....cubic yard..	.129	236,713	30,535.99	336,882	43,457.79
Logging.....hours..	.....	7:00	235.54	19:55	604.54
West dock channel.					
Dredging.....cubic yard..	.149	331,852	49,445.95	339,592	50,599.21
Logging.....hours..	.....	100:20	2,631.59	100:35	2,642.37
Board of inspectors.					
Per day per man.....	.60	1,127	676.20	2,402½	1,441.50
Total.....	.....	.....	89,399.09	.....	203,957.63

This contract is now 83¾ per cent completed. Two hundred thousand cubic yards in the dock channel and turning basin remains to be excavated.

Under contract with Groch & Townsend, dated July 2, 1906, the following work has been accomplished:

5,478 cubic yards bed rock excavated and removed, at $2.05	$11,229.90
4,600 cubic yards overlying material excavated and removed, at 20 cents	920.00
Total	12,149.90

This contract was completed June 22. In addition to excavating a 60-foot channel 21 feet deep for the Government, these same contractors have excavated a width of 60 feet through rock on each side of the Government cut to a depth of 21 feet.

The U. S. dredge *Burton* worked on the outer bar from December 15 to 22, removing 4,014 cubic yards.

The following is a statement of expenditures made on account of improving harbor at Sandusky City, Ohio, during the fiscal year 1907:

General administration:		
Office and engineering	$1,826.50	
Examinations and surveys	584.84	
Travel and miscellaneous	170.90	
Purchase and repair of plant	21.93	
Advertising	13.62	
		$2,617.79
Dredging (The Great Lakes Dredge and Dock Company):		
Paid to contractor		94,240.14
Removal of rock (Groch & Townsend):		
Paid to contractor		9,675.00
Inspection of contract work		3,103.92

Dredging (U. S. dredge *Burton*):		
Services	$3,834.35	
Supplies	1,139.82	
Repairs	1,442.55	
Subsistence	660.66	
		$7,077.38
Dredging (U. S. dredge *Maumee*):		
Services	1,040.85	
Supplies	514.86	
Repairs	1,301.56	
Subsistence	224.84	
		3,082.11
U. S. steamer *Visitor* and tug *Quest*:		
Services	262.69	
Supplies	168.79	
Repairs	444.81	
Subsistence	186.14	
		1,062.43
Total expended		120,858.77

Money statement.

July 1, 1906, balance unexpended	$202,623.63
Amount appropriated by river and harbor act approved March 2, 1907	125,000.00
Amount appropriated by sundry civil act approved March 4, 1907	175,000.00
	502,623.63
June 30, 1907, amount expended during fiscal year, for works of improvement	120,858.77
July 1, 1907, balance unexpended	381,764.86
July 1, 1907, outstanding liabilities	14,881.24
July 1, 1907, balance available	366,883.62
July 1, 1907, amount covered by uncompleted contracts	80,528.16
Amount (estimated) required for completion of existing project	135,000.00

Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$115,000.00	
For maintenance of improvement	25,000.00	
		140,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

May 20, 1826 (survey)	$400.00	August 11, 1888	$40,000.00
June 11, 1844	15,000.00	September 19, 1890	45,000.00
August 30, 1852	15,000.00	July 13, 1892	41,712.00
June 28, 1864 (allotment)	10,000.00	August 18, 1894	30,000.00
June 23, 1866	38,580.00	June 3, 1896	40,000.00
June 11, 1870	10,000.00	March 3, 1899	80,000.00
June 10, 1872	13,000.00	June 13, 1902	125,000.00
March 3, 1873	25,000.00	April 28, 1904 (allotment)	10,000.00
June 23, 1874	25,000.00	March 3, 1905	125,000.00
March 3, 1875	25,000.00	June 30, 1906	175,000.00
August 14, 1876	25,000.00	March 2, 1907	125,000.00
June 18, 1878	20,000.00	March 4, 1907	175,000.00
March 3, 1879	1,000.00		
July 14, 1880	12,500.00	Total	1,292,192.00
March 3, 1881	10,000.00	Expended to June 30, 1907	910,427.14
August 2, 1882	10,000.00		
July 5, 1884	20,000.00		
August 5, 1886	5,000.00		381,764.86

CONTRACTS IN FORCE.

CONTRACT FOR DREDGING AT SANDUSKY HARBOR, OHIO.

Name of contractor: The Great Lakes Dredge and Dock Company, Chicago, Ill.
Date of contract: June 14, 1905.
Date of approval: July 8, 1905.
Date of commencement: June 20, 1905.
Date of completion: July 1, 1907.

CONTRACT FOR DREDGING AT SANDUSKY HARBOR, OHIO.

Name of contractor: Groch & Townsend, Sandusky, Ohio.
Date of contract: July 2, 1906.
Date of approval: August 16, 1906.
Date of commencement: August 1, 1906.
Date of completion: October 31, 1906.
Extended for a reasonable period.

COMMERCIAL STATISTICS.

The following statistics for the year 1906 relative to the commerce of the harbor of Sandusky, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Fish	3,150	Coal and coke	785,804
Grain and produce	40,769	Stone, lime, and sand	160,000
Iron ore	36,779	Salt	50
Iron, pig	2,055	Miscellaneous	34,207
Lumber, logs, etc	57,619		
Salt	6,428		
Stone, lime, and sand	199,097		
Miscellaneous	40,705		
Total	386,602	Total	980,061

Total freight tonnage:

1906	1,366,663
1905	1,468,677
Decrease	102,014

Vessels.	Number.	Tonnage.
Entering	7,123	1,289,208
Departing	7,134	1,311,321
Built	2	12

Total registered tonnage (vessels entering and departing):

1906	2,600,529
1905	2,454,346
Increase	146,183

Draft of largest vessel using harbor, 24 feet.
Largest vessels do not load to full depth.
One new vessel line established during the year.

QQ 4.

IMPROVEMENT OF HURON HARBOR, OHIO.

A description of the early conditions of the harbor at the mouth of Huron River and of the projects for its improvement is given on pages 2653 and 2654, Report of Chief of Engineers, 1898.

The present project is given in full in the Report of Chief of Engineers, 1904, pages 3209 to 3218, inclusive.

At the close of the last fiscal year work was being started under a contract entered into April 6, 1906, with the Hunkin Brothers Construction Company, of Cleveland, Ohio, for building concrete superstructure on 582 linear feet of the west pier and on the two pierheads at the entrance; also for constructing a rubble mound jetty on the east side of the entrance, 1,800 feet long.

The following is a statement of the work done under this contract:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
New superstructure.					
Old superstructure prepared for new, linear feet	$10.00	56	$560.00	56	$560.00
Concrete blocks.....cubic yards..	10.00	797.95	7,979.50	797.95	7,979.50
Concrete in mass.....do....	8.00	2,019.7	16,157.60	2,019.7	16,157.60
Small riprap stone.....tons..	1.00	1,851.61	1,851.61	1,851.61	1,851.61
Paving for pierheads.....square feet..	.70	.....	.....	.....	.....
Oak fender above water.....M feet..	60.00	3,287	197.22	3,287	197.22
Mooring rings.....pounds..	.10	304	30.40	304	30.40
Sleeve bolts and washers.....do....	.05	1,824	91.20	1,824	91.20
Tie rods and washers.....do....	.10	.....	.....	.....	.....
Total	.....	.....	26,867.53	.....	26,867.53
Rubble mound jetty.					
Fascine mattress.....100 square feet..	30.00	162.87	4,886.10	162.87	4,886.10
Small riprap stone.....tons..	1.30	4,599.83	5,979.78	4,599.83	5,979.78
Quarry-run stone.....do....	1.30	19,259.44	25,037.27	19,259.44	25,037.27
Large placed stone.....do....	1.70	6,247.42	10,620.61	6,247.42	10,620.61
Total	.....	.....	46,523.76	.....	46,523.76
Sheathing.					
Oak fender below water.....M feet..	100.00	318	31.80	318	31.80
Hardwood sheathing plank.....do....	100.00	213	21.30	213	21.30
Lag screws and washers.....pounds..	.06	86	5.16	86	5.16
Screw bolts and washers.....do....	.10	94	9.40	94	9.40
Total	.....	.....	67.66	.....	67.66
Grand total	.....	.....	73,458.95	.....	73,458.95

The concrete superstructure on the east and west pierheads and 228.5 linear feet of the west pier has been completed, and 1,110 linear feet of the east jetty has been built up to an average of 5 feet above mean lake level.

The following is a statement of expenditures made on account of improving harbor at Huron, Ohio, during the fiscal year 1907:

General administration:		
Office and engineering	$2,159.50	
Examinations and surveys	56.84	
Travel and miscellaneous	122.54	
Purchase and repair of plant	53.89	
		$2,392.77

Concrete superstructure, rubble mound jetty, and sheathing (The Hunkin Brothers Construction Company):		
Paid to contractor	$52,311.58	
Inspection and services	4,015.38	
		$56,326.96
Repair and reconstruction of piers:		
Materials	2.75	
Services	30.55	
		33.30
Dredging (U. S. dredge *Maumee*):		
Services	715.49	
Supplies	255.60	
Subsistence	117.98	
		1,089.07
Total expended		59,842.10

Money statement.

July 1, 1906, balance unexpended		$172,706.22
Amount appropriated by river and harbor act approved March 2, 1907		16,000.00
Amount appropriated by sundry civil act approved March 4, 1907		47,000.00
		235,706.22
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$59,808.80	
For maintenance of improvement	33.30	
		59,842.10
July 1, 1907, balance unexpended		175,864.12
July 1, 1907, outstanding liabilities		14,367.44
July 1, 1907, balance available		161,496.68
July 1, 1907, amount covered by uncompleted contracts		86,769.41
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907		10,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

May 20, 1826	$5,000.00	August 5, 1886	$3,000.00
May 19, 1828	4,413.35	August 11, 1888	6,000.00
March 3, 1829	5,935.00	September 19, 1890	16,000.00
April 23, 1830	1,880.36	July 13, 1892	15,000.00
March 2, 1831	3,480.00	August 18, 1894	10,000.00
July 3, 1832	1,500.00	June 3, 1896	8,000.00
June 28, 1834	6,700.00	March 3, 1899	25,000.00
June 2, 1836	4,300.00	June 13, 1902	40,000.00
March 3, 1837	2,565.00	April 28, 1904 (allotment)	40,000.00
July 7, 1838	5,000.00	March 3, 1905	68,500.00
June 11, 1844	5,000.00	Proceeds of sale of Government property	25.93
August 30, 1852	10,000.00	June 30, 1906	150,000.00
June 23, 1866	39,000.00	March 2, 1907	16,000.00
June 23, 1874	1,500.00	March 4, 1907	47,000.00
March 3, 1875	1,000.00		
June 18, 1878	1,000.00		
June 14, 1880	3,000.00	Total	558,799.64
March 3, 1881	3,000.00	Expended to June 30, 1907	382,935.52
August 2, 1882	2,500.00		
July 5, 1884	7,500.00		175,864.12

CONTRACT IN FORCE.

CONTRACT FOR CONSTRUCTING CONCRETE SUPERSTRUCTURE ON TWO NEW PIERHEADS, 240 FEET OF NEW JETTY AND 342 LINEAR FEET OF OLD JETTY; FOR CONSTRUCTING 1,800 LINEAR FEET OF RUBBLE MOUND JETTY; FOR SHEATHING 342 LINEAR FEET OF OLD JETTY.

Name of contractor: The Hunkin Brothers Construction Company, Cleveland, Ohio.
Date of contract: April 23, 1906.
Date of approval: May 8, 1906.
Date of commencement: August 13, 1906.
Date of completion: November 30, 1907.

COMMERCIAL STATISTICS.

The following statistics for the year 1906, relative to the commerce of the harbor of Huron, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Fish	250	Coal and coke	786,608
Iron ore	871,697	Iron ore	11,819
Iron, manufactures of	67	Miscellaneous	7
Lumber, logs, etc	1,710		
Miscellaneous	2,943		
Total	876,667	Total	798,429

Total freight tonnage:

1906	1,675,096
1905	1,719,550
Decrease	44,454

Vessels.	Number.	Tonnage.
Entering	438	751,376
Departing	453	730,997

Total registered tonnage:

1906	1,482,373
1905	1,329,306
Increase	153,067

Draft of largest vessels using harbor, 24 feet.
Largest vessels do not load to full depth.
No new vessel lines established during the year.

Q Q 5.

IMPROVEMENT OF VERMILION HARBOR, OHIO.

For a description and history of this improvement see page 2696, Report of Chief of Engineers, 1898.

The river and harbor act of March 2, 1907, appropriated $15,000 for maintenance at this harbor, and plans and specifications have been prepared and contract awarded for reinforcing the remainder of the

west jetty and so much of the east jetty, in accordance with the approved project, as the funds available will permit.

No works of improvement have been carried on during the year.

The following is a statement of expenditures made on account of improving harbor at Vermilion, Ohio, during the fiscal year 1907:

General administration:	
Travel and miscellaneous	$3.35
Repair of jetties (The Buckeye Contracting Company):	
Paid to contractor	1,354.09
Total expended	1,357.44

Money statement.

July 1, 1906, balance unexpended	$1,481.88
Amount appropriated by river and harbor act approved March 2, 1907	15,000.00
	16,481.88
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,357.44
July 1, 1907, balance unexpended	15,124.44
July 1, 1907, outstanding liabilities	45.94
July 1, 1907, balance available	15,078.50
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	5,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

July 2, 1836	$10,000.00	August 11, 1888	$1,000.00
March 3, 1837	20,000.00	September 19, 1890	2,000.00
July 7, 1838	23,626.57	July 13, 1892	2,000.00
June 28, 1864 (allotment)	5,758.97	June 3, 1896	2,000.00
June 23, 1866	15,315.74	August 18, 1894	2,000.00
June 10, 1872	5,000.00	June 6, 1900 (allotment)	176.27
March 3, 1873	12,000.00	August 5, 1902 (allotment)	400.00
June 23, 1874	3,000.00	March 3, 1905	15,000.00
March 3, 1875	10,000.00	March 2, 1907	15,000.00
August 14, 1876	5,000.00		
June 18, 1878	4,000.00	Total	163,277.55
June 14, 1880	2,000.00	Expended to June 30, 1907	148,153.11
March 3, 1881	2,000.00		
August 2, 1882	3,000.00		15,124.44
August 5, 1886	3,000.00		

CONTRACT IN FORCE.

CONTRACT FOR STONE REENFORCEMENT AND REPAIR OF JETTIES.

Name of contractor: The Buckeye Contracting Company, Cleveland, Ohio.
Date of contract: June 20, 1905.
Date of approval: July 3, 1905.
Time of commencement: July 5, 1905.
Date of completion: January 30, 1906.

COMMERCIAL STATISTICS.

The following statistics for the year 1906 relative to the commerce of the harbor of Vermillion, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Fish	800	Coal and coke	10
		Miscellaneous	215
Total	800	Total	225

Total freight tonnage:

1906	1,025
1905	8,210
Decrease	7,185

Vessels.	Number.	Tonnage.
Entering	27	631
Departing	24	445

Total registered tonnage:

1906	1,076
1905	1,416
Decrease	340

Draft of largest vessels using harbor, 12 feet.
Largest vessels do not load to full depth.
No new vessel lines established during the year.

Q Q 6.

IMPROVEMENT OF LORAIN HARBOR, OHIO.

A description of the location, conditions, and projects for improvement of this harbor is given on pages 2658 and 2718 to 2728, Report of Chief of Engineers, 1898.

Work is being done at this harbor under a contract with Patrick Keohane, of Fayetteville, N. Y., dated October 27, 1900, for constructing west breakwater, two pierheads, and removing and rebuilding parts of the east and west piers; and also a second contract with this same party dated August 3, 1904, for constructing the east breakwater. Work is also being done under a contract with the Buckeye Contracting Company, of Cleveland, Ohio, dated July 3, 1905, for reconstructing part of the west pier.

The following table shows the work which has been done under the contract dated October 27, 1900, for constructing west breakwater, two pierheads, and removing and rebuilding parts of the east and west piers during the fiscal year:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
West breakwater.					
Paving ..... tons..	$1.87	.....	.....	.....	.....
Small riprap stone ..... do....	.89	.....	.....	617.7	$549.75
Heavy riprap stone ..... do....	.90	6,301.5	$5,671.35	43,218.7	38,896.83
Core filling ..... do....	.70	6,365.4	4,455.78	74,265.6	51,985.92
Quarry-run stone ..... do....	1.12	12,836.6	14,376.99	12,836.6	14,376.99
Total	.....	.....	24,504.12	.....	105,809.49
East and West pier reconstruction and pierheads.					
Dredging ..... cubic yards..	.19	.....	.....	125,162	23,780.78
Old pier removed ..... linear feet..	4.10	.....	.....	1,943	7,966 30
Hemlock timber ..... M feet..	22.00	.....	.....	2,611,093	57,444.05
Oak timber ..... do....	38.00	.....	.....	240,160	9,126.08
Bolts, tie-rods, etc ..... pounds..	.035	.....	.....	554,840	19,419.40
Lag screws and spikes ..... do....	.04	.....	.....	255,768	10,231.52
Straps ..... do....	.05	.....	.....	2,113	105.65
Concrete blocks ..... cubic feet..	.37	4,986.57	1,845.03	74,898.68	27,712.51
Concrete mass ..... cubic yards..	7.30	281.56	2,055,39	6,478.79	47,295.17
Filling stone and pierhead foundation, tons	.89	.....	.....	33,109.4	29,467.37
Foundation stone for piers ..... tons..	.89	.....	.....	3,261.8	2,903.00
Heavy riprap for pierhead foundation, tons	.90	.....	.....	3,699.9	3,329.91
Paving for well ..... tons..	2.25	.....	.....	.....	.....
Total	.....	.....	3,900.42	.....	238,781.74
Grand total	.....	.....	28,404.54	.....	344,591.23

Under a supplementary agreement dated April 12, 1907, the construction of the west breakwater has been modified in accordance with finding of board of engineer officers appointed to consider the Cleveland breakwater. Under this modification an outer thickness of 5 feet of selected quarry-run stone is substituted for the paving called for by the original plans. This contract expired August 31, 1905. By authority of the Chief of Engineers the time was extended for a reasonable period. But little work has been done during the past year.

At the present time the work is 75¾ per cent completed. The substructure cribs for pierheads at the entrance are in place, and the concrete superstructure on the west pierhead is half completed. The west breakwater has been built up to 4 feet above mean lake level for 300 feet, and to −8 feet for 1,200 feet, and work is progressing under modification adopted.

The work accomplished under contract dated August 3, 1904, for constructing the east breakwater is shown in the following table:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
East breakwater.					
Core filling ..... cubic yards..	$0.70	.....	.....	18,646.7	$13,052.69
Quarry-run stone ..... tons..	1.10	10,906.2	$11,996.82	45,762.6	50,338.86
Large placed stone ..... do....	1.43	12,710.7	18,176.30	29,235.2	41,806.34
Total	.....	.....	30,173.12	.....	105,197.89

This contract expired December 1, 1906, but was extended for a reasonable period by authority of the Chief of Engineers. At the present time 1,000 feet of the east breakwater has been completed and 300 feet built up to the water surface, and the whole work under this contract 73¾ per cent completed.

The following table shows the work accomplished under the contract, dated July 3, 1905, for reconstructing part of the west pier:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
West pier.					
Preparing old superstructure..linear feet..	$9.75	320.00	$3,120.00	561	$5,469.75
Concrete blocks .....cubic yards..	10.50	355.83	3,736.21	634.12	6,658.26
Concrete in mass .....do....	7.40	1,011.12	7,482.29	1,603.12	11,863.09
Hard wood sheathing.....M feet..	123.00	18,341.00	2,255.94	26,703.00	3,284.47
Oak timber .....do....	89.00	4,732.00	421.16	6,181.00	550.12
Lag screws and washers .....pounds..	.05	5,928.00	296.40	8,826.00	441.30
Screw bolts and washers.....do....	.05	554.20	27.71	926.80	46.34
Sleeve bolts and washers .....do....	.05	1,908.00	95.40	1,977.00	98.85
Tie-rods and washers .....do....	.06	1,560.00	93.60	1,560.00	93.60
Small riprap stone .....tons..	1.05	694.41	729.14	1,024.61	1,075.85
Broken stone .....do....	1.45	49.46	71.92	85.06	123.35
Total	.....	.....	18,329.77	.....	29,704.98

This contract expired June 30, 1906, but has been extended by the Chief of Engineers for a reasonable period. At the present time 472 linear feet of west pier has been reconstructed, completing 67½ per cent of the contract.

The following is a statement of expenditures made on account of improving harbor at Lorain, Ohio, during the fiscal year 1907:

General administration:		
Office and engineering	$766.50	
Travel and miscellaneous	80.31	
Purchase and repair of plant	63.50	
		$910.31
Construction of breakwaters—contracts, Patrick Keohane and Buckeye Contracting Company:		
Paid Patrick Keohane (contract 1900)	13,102.70	
Paid Patrick Keohane (contract 1904)	48,702.64	
Paid Buckeye Contracting Company (contract 1905)	17,679.54	
Inspection and services	3,346.16	
		82,831.04
Repair of pier:		
Materials		162.50
Dredging (U. S. dredge *Maumee* and fleet):		
Services	1,081.00	
Supplies	368.44	
Repairs	59.60	
Subsistence	189.72	
		1,698.76
Total expended		85,602.61

Money statement.

July 1, 1906, balance unexpended		$318,015.36
Amount appropriated by river and harbor act approved March 2, 1907		30,000.00
		348,015.36
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$83,741.35	
For maintenance of improvement	1,861.26	
		85,602.61
July 1, 1907, balance unexpended		262,412.75
July 1, 1907, outstanding liabilities		14,128.07
July 1, 1907, balance available		248,284.68
July 1, 1907, amount covered by uncompleted contracts		176,365.34
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907 Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		15,000.00

APPROPRIATIONS.

May 23, 1828	$7,500.00	August 5, 1886	$10,000.00
April 23, 1830	8,559.77	August 11, 1888	10,000.00
May 2, 1831	9,275.00	September 19, 1890	12,000.00
July 3, 1832	8,000.00	July 13, 1892	20,000.00
March 2, 1833	2,400.00	August 18, 1894	10,000.00
June 28, 1834	5,000.00	June 3, 1896	30,000.00
March 3, 1835	4,400.00	March 3, 1899	50,000.00
July 2, 1836	6,660.00	June 6, 1900	125,000.00
March 3, 1837	6,410.00	June 13, 1902	6,000.00
July 7, 1838	5,000.00	June 23, 1902	300,000.00
August 30, 1852	5,000.00	March 3, 1903	9,000.00
June 28, 1864 (allotment)	20,000.00	April 28, 1904	100,000.00
June 23, 1866	10,000.00	March 3, 1905 (2)	105,000.00
June 10, 1872	20,000.00	June 30, 1906	46,000.00
March 3, 1873	20,000.00	Received from other sources	79.60
June 23, 1874	20,000.00	March 2, 1907	30,000.00
March 3, 1875	10,000.00		
August 14, 1876	6,000.00	Total	1,063,284.37
June 18, 1878	1,000.00	Expended to June 30, 1907	800,871.62
June 14, 1880	1,000.00		
March 3, 1881	7,000.00		262,412.75
August 2, 1882	7,000.00		
July 5, 1884	10,000.00		

CONTRACTS IN FORCE.

CONTRACT FOR CONSTRUCTING WEST BREAKWATER, TWO PIERHEADS, REMOVING AND REBUILDING PARTS OF EAST AND WEST PIERS.

Name of contractor: Patrick Keohane, Fayetteville, N. Y.
Date of contract: October 27, 1900.
Date of approval: November 22, 1900.
Date of commencement: April 1, 1901.
Date of completion: August 31, 1905.
Extended to December 1, 1906.

CONTRACT FOR CONSTRUCTING THE EAST BREAKWATER.

Name of contractor: Patrick Keohane, Fayetteville, N. Y.
Date of contract: August 3, 1904.
Date of approval: September 16, 1904.
Date of commencement: October 10, 1904.
Date of completion: December 31, 1906.
Extended for a reasonable period.

CONTRACT FOR RECONSTRUCTING AND REPAIRING PARTS OF WEST PIER.

Name of contractor: The Buckeye Contracting Company, Cleveland, Ohio.
Date of contract: July 3, 1905.
Date of approval: July 21, 1905.
Date of commencement: August 14, 1905.
Date of completion: June 30, 1906.
Extended for a reasonable period.

COMMERCIAL STATISTICS.

The following statistics for the year 1906 relative to the commerce of the harbor of Lorain, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Fish	500	Coal and coke	1,807,098
Iron ore	2,417,109	Iron, pig, and manufactures of	34
Iron, pig	80,167	Miscellaneous	1,419
Lumber, logs, etc	16,927		
Stone, lime, and sand	52,268		
Miscellaneous	169		
Total	2,517,140	Total	1,808,551

Total freight tonnage:

1906	4,325,691
1905	3,265,486
Increase	1,060,205

Vessels.	Number.	Tonnage.
Entering	854	1,794,024
Departing	726	1,802,292
Built	7	35,581

Total registered tonnage (vessels entering and departing):

1906	3,596,316
1905	2,941,917
Increase	654,399

Draft of largest vessels using harbor, 24 feet.
No new vessel lines established during the year.
Largest vessels do not load to full depth.

Q Q 7.

IMPROVEMENT OF CLEVELAND HARBOR, OHIO.

For a history of the early conditions and projects of improvement see pages 2661–2662, Report of Chief of Engineers for 1898, and pages 530 and 531, Report of the Chief of Engineers for 1899.

The work of repairing the shore end of the west breakwater under a contract with the Hunkin Brothers Construction Company, of Cleveland, Ohio, was completed August 25, 1906.

The following statement shows in detail the cost of executing the contract:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Preparing old superstructure for new work.....linear feet..	$18.00	.....	.....	662.6	$11,926.80
Concrete blocks.....cubic yards..	10.00	.....	.....	758.6	7,586.00
Concrete in mass.....do....	7.50	29.17	$218.76	4,140.5	31,053.75
Large riprap stone.....tons..	1.25	5,165.2	6,456.50	5,379.2	6,724.00
Hardwood sheathing.....M feet..	135.00	3,625	489.37	17,482	2,360.07
Oak timber above water.....do....	60.00	5,616	336.96	11,376	682.56
Oak timber below water.....do....	100.00	.....	.....	4,335	433.50
Mooring rings.....pounds..	.10	.....	.....	450	45.00
Lag screws and washers.....do....	.03	1,687	50.61	7,539	226.17
Screw bolts and washers.....do....	.03	.....	.....	2,082	62.46
Sleeve bolts and washers.....do....	.03	2,218	66.54	4,839	145.17
Tie rods and washers.....do....	.10	.....	.....	5,167	516.70
Total.....	.....	.....	7,618.74	.....	61,762.18

The work of improvement of the main entrance of Cleveland Harbor, Ohio, is being done under a continuous contract with the L. P. & J. A. Smith Company, of Cleveland, Ohio, dated November 19, 1902.

The following is a tabular statement of work done under this contract:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Two pier heads (complete).....	.....	.....	.....	.....	$70,077.64
Two rubble mound breakwaters.					
Large riprap stone.....tons..	$1.50	758.8	$1,138.20	69,231.4	103,847.10
Small riprap stone.....do....	1.30	3,050	3,965.00	28,379.2	36,892.96
Quarry run stone.....do....	1.45	24,453.6	35,457.73	24,453.6	35,457.73
Paving stone, first class.....do....	3.00	880	2,640.00	880	2,640.00
Paving stone, second class.....do....	2.90	630	1,827.00	630	1,827.00
Gravel, core filling.....cubic yards..	.70	1,704.4	1,193.08	46,102.2	32,271.54
Sand, core filling.....do....	.40	.....	.....	44,384.8	17,753.92
Total.....	.....	.....	46,221.01	.....	230,690.25
Riprap protection for present breakwaters.					
Large riprap stone.....tons..	1.50	156.7	235.05	27,338.5	41,007.75
Small riprap stone.....do....	1.30	997.5	1,296.75	10,367	13,477.10
Quarry run stone.....do....	1.45	537.2	778.94	537.2	778.94
Paving stone, second class.....do....	2.90	491	1,423.90	781	2,264.90
Gravel, core filling.....cubic yards..	.70	548.8	384.16	8,491.8	5,944.26
Sand, core filling.....do....	.40	.....	.....	512	204.80
Total.....	.....	.....	4,118.80	.....	63,677.75
Grand total.....	.....	.....	50,339.81	.....	364,445.64

This work is now 56½ per cent completed. The two pierheads at the new entrance are entirely finished; the west breakwater is finished for 150 feet and above the water surface for remaining length; the east breakwater foundation ridges are up to — 10 and — 14 feet and the core to — 20. The protection ridges are up to — 12.

The work for the improvement and enlargement of Cleveland Harbor, by extending the main breakwater eastward, is being done under contracts dated November 20, 1902, for the eastern and western divisions.

The following is a tabular statement of the work done under these contracts:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Pier head.					
Hemlock timber.....M feet..	$28.00	.....	.....	177,368	$4,966.30
Oak timber .....do....	50.00	.....	.....	1,440	72.00
Beech timber .....do....	45.00	.....	.....	16,320	734.40
Large riprap stone.....tons..	1.30	.....	.....	1.185	1,540.50
Small riprap stone.....do....	1.14	.....	.....	5,247	5,981.58
Small paving stone .....do....	4.00	.....	.....	191.7	766.80
Bolts, tie rods, etc .....pounds..	.04	.....	.....	38,755	1,550.20
Concrete blocks .....cubic yards..	11.00	.....	.....	226.6	2,492.60
Concrete mass .....do....	8.00	.....	.....	466	3,728.00
Wrought iron pipe.....pounds..	.50	.....	.....	271	135.50
Total	.....	.....	.....	.....	21,967.88
Rubble mound breakwater (western division).					
Heavy riprap stone .....tons..	1.35	.....	.....	746.5	1,007.78
Large riprap stone .....do....	1.30	3,920.9	$5,097.17	191,902.4	249,473.12
Small riprap stone.....do ...	1.14	.....	.....	58,802	67,034.28
Quarry run stone .....do....	1.083	32,898.1	35,628.65	103,463.5	112,050.97
Do.....	1.30	46,454.5	60,390.85	46,454.5	60,390.85
Paving stone, first class.....tons..	2.75	21,839.9	60,059.62	31,981.6	87,949.40
Paving stone, second class.....do....	2.70	.....	.....	12,917.2	34,876.44
Core filling, shale .....cubic yards..	.70	5,164.6	3,615.22	153,142.5	107,199.75
Core filling, sand .....do....	.40	.....	.....	140,779.3	56,311.72
Total	.....	.....	164,791.51	.....	776,294.31
Rubble mound breakwater (eastern division).					
Large riprap stone .....tons..	1.30	4,150.6	5,395.78	122,628.1	159,416.53
Small riprap stone.....do....	1.14	.....	.....	55,564.9	63,343.99
Quarry run stone .....do....	1.083	.....	.....	7,965.9	8,627.07
Do.....	1.30	9,437.1	12,268.23	9,437.1	12,268.23
Core filling, shale .....cubic yards..	.70	14,787.8	10,351.46	106,721.2	74,704.84
Core filling, sand .....do....	.40	16,505	6,602.00	98,964.4	39,585.76
Total	.....	.....	34,617.47	.....	357,946.42
Grand total.....	.....	.....	199,408.98	.....	1,156,208.61

The western division is about 84¼ per cent, the eastern division about 56¼ per cent, and the whole work 58¾ per cent completed.

During the storm which occurred on Lake Erie, October 26, 1906, a considerable settling was observed in the completed portion of the new rubble mound east breakwater. The principal settlement occurred in the first two 1,000-foot sections, where sand had been used in large quantities as a core filling. A board of engineer officers appointed to consider this matter approved, by report dated March 23, 1907, of the modification in the cross section suggested by the district officer, which was to abandon the use of sand and shale as a core filling and to complete the structure entirely of quarry-run stone containing not more than 25 per cent of stones weighing less than 1 ton, and using an

outside covering 5 feet thick composed of stones weighing not less than 3 tons each, set with their greatest dimensions into the work. This modification in the Cleveland breakwater has been made to apply to all similar structures in the district, and work is now in progress under this plan, but has not advanced far enough yet to formulate an opinion on the merits of this style of structure.

At the time the change was made about 2,000 feet of the breakwater had been completed in accordance with the original plans and 1,000 feet additional was nearly completed.

The condition of the work is approximately as follows:

The first, second, and third 1,000-foot sections are practically completed; the fourth and fifth sections have been built up to the water surface; the sixth, seventh, eighth, ninth, and tenth sections are up to —10 feet on the harbor side, —14 feet on the lake side, and from —15 to —20 feet along the center.

The improvement of Cleveland Harbor by dredging is being carried on under a contract with the L. P. & J. A. Smith Company, of Cleveland, Ohio, dated June 28, 1905. The work, which consists in deepening part of the west basin to a depth of 25 feet, was practically completed June 30, 1907.

The following statement shows the total work done under this contract:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Dredging.....cubic yards..	$0.11½	980,820	$112,794.29	1,237,400	$142,301.00
Logging.....hours..	.....	1½	33.79	6½	125.89
Board of inspectors.....per day per man..	.75	532	399.00	532	399.00
Total.....	.....	.....	113,227.08	.....	142,825.89

Minor repairs by hired labor and purchase of material have been made, as follows:

Maintenance and repair:	
West breakwater, concrete superstructure repairs	$1,836.73
West pier, concrete superstructure repairs	772.08
Total	2,608.81

The U. S. dredge *Maumee* worked in the east basin, in front of the coal docks, from October 8 to November 19, excavating a total of 26,474 cubic yards.

A statement of expenditures made on account of improving harbor at Cleveland, Ohio, during the fiscal year 1907, will be found on the page following.

Main entrance and new breakwater.

General administration:		
Office and engineering	$2,062.00	
Supplies	284.90	
Purchase and repair of plant	1,209.73	
Travel and miscellaneous	433.36	
		$3,989.99
Repair of observation chamber:		
Inspection and services		112.26
Main entrance (The L. P. & J. A. Smith Company):		
Paid to contractor	18,095.91	
Operation and maintenance of Government plant	1,371.18	
Inspection and services	5,394.83	
		24,861.92
New breakwater (Hughes Brothers & Bangs):		
Paid to contractor	215,303.89	
Operation and maintenance of Government vessels and plant	2,057.23	
Inspection and services	10,848.81	
		228,209.93
Total expended		257,174.10

General improvement.

General administration:		
Supplies	$86.66	
Purchase, care, and repair of plant	954.15	
Travel and miscellaneous	33.66	
		$1,074.47
Repair of west breakwater (contract, Hunkin Brothers):		
Paid to contractor	15,179.28	
Inspection and services	773.66	
		15,952.94
Repairs to west pier (open market):		
Materials	63.14	
Inspection and services	708.94	
		772.08
Repairs to west breakwater:		
Materials	229.35	
Inspection and services	1,607.38	
		1,836.73
Total expended		19,636.22

Dredging.

General administration:		
Miscellaneous		$61.91
Contract (The L. P. & J. A. Smith Company):		
Paid to contractor	$99,815.81	
Inspection	2,320.72	
		102,136,53
U. S. dredge *Burton:*		
Services	221.67	
Supplies	46.15	
		267.82
U. S. dredge *Maumee* and fleet:		
Services	1,372.55	
Repairs	380.02	
Supplies	279.01	
Subsistence	377.80	
		2,409.38
New dump scows:		
Materials		2,817.76
Total expended		107,693.40

Money statements.

NEW ENTRANCE, BREAKWATER EXTENSION, ETC., ACT OF JUNE 13, 1902.

July 1, 1906, balance unexpended		$753,499.63
Amount appropriated by river and harbor act approved March 2, 1907		200,000.00
		953,499.63
June 30, 1907, amount expended during fiscal year, for works of improvement		257,174.10
July 1, 1907, balance unexpended		696,325.53
July 1, 1907, outstanding liabilities		60,418.29
July 1, 1907, balance available		635,907.24
July 1, 1907, amount covered by uncompleted contracts		1,020,633.14
Amount (estimated) required for completion of existing project		2,293,956.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907		700,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.		

UNDER CONTRACTS, ETC., AUTHORIZED BY ACT OF JUNE 3, 1896.

July 1, 1906, balance unexpended		$68,929.66
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$16,073.26	
For maintenance of improvement	3,562.96	
		19,636.22
July 1, 1907, balance unexpended		49,293.44
July 1, 1907, outstanding liabilities		406.37
July 1, 1907, balance available		48,887.07

MAINTENANCE (DREDGING) AND CONTINUING IMPROVEMENT.

July 1, 1906, balance unexpended		$189,316.84
Receipts from sales		49.15
Amount appropriated by river and harbor act approved March 2, 1907		223,000.00
		412,365.99
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$105,016.20	
For maintenance of improvement	2,677.20	
		107,693.40
July 1, 1907, balance unexpended		304,672.59
July 1, 1907, outstanding liabilities		9,325.20
July 1, 1907, balance available		295,347.39
July 1, 1907, amount covered by uncompleted contracts		21,769.31
Amount (estimated) required for completion of existing project		203,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907		125,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.		

APPROPRIATIONS.

March 3, 1825	$5,000.00
March 2, 1827	10,000.00
March 29, 1829	12,179.00
April 23, 1830	1,786.56
March 2, 1831	3,670.00
July 3, 1832	6,600.00
June 28, 1834	13,315.00
July 2, 1836	15,006.59
March 3, 1837	10,000.00
July 7, 1838	51,856.00
June 11, 1844	25,000.00
August 30, 1852	30,000.00
March 3, 1853	145.69
June 28, 1864 (allotment	20,000.00
June 23, 1866	59,806.00
June 25, 1868 (allotment)	17,000.00
April 10, 1869 (allotment)	13,380.00
July 11, 1870	20,000.00
March 3, 1871 (allotment for repairs)	636.77
March 3, 1873	1,000.00
June 24, 1874	30,500.00
Total previous to adoption of project for harbor of refuge	346,881.61
March 3, 1875	50,000.00
August 14, 1876 (repair of pier)	8,000.00
August 14, 1876	50,000.00
June 18, 1878	100,000.00
March 3, 1879	100,000.00
June 14, 1880	125,000.00
March 3, 1881	$200,000.00
August 2, 1882	175,000.00
July 3, 1884	100,000.00
August 5, 1886	93,750.00
August 11, 1888	100,000.00
September 19, 1890	75,000.00
July 13, 1892	100,000.00
August 18, 1894	50,000.00
June 3, 1896	80,000.00
June 4, 1897	350,000.00
July 1, 1898	294,000.00
March 3, 1899	175,000.00
June 6, 1900	175,000.00
June 13, 1902	625,000.00
June 28, 1902	107,000.00
March 3, 1903	227,500.00
April 28, 1904	485,200.00
February 4, 1903 (unexpended balance of allotment of $6,000 for repair of levee of Muskingum River, for improving harbor at Cleveland, Ohio)	56.52
March 3, 1905	830,800.00
June 30, 1906	350,000.00
Received from other sources	551.14
March 2, 1907	223,000.00
March 4, 1907	200,000.00
Total	5,796,739.27
Expended to June 30, 1907	4,746,447.71
	1,050,291.56

CONTRACTS IN FORCE.

CONTRACTS FOR IMPROVEMENT AND ENLARGEMENT OF CLEVELAND HARBOR, OHIO.

Name of contractor: Hughes Brothers & Bangs, Syracuse, N. Y.
Date of contracts: November 20, 1902.
Date of approval: December 30, 1902.
Date of commencement: May 1, 1903.
Date of completion: December 31, 1908.

CONTRACT FOR IMPROVEMENT AND ENLARGEMENT OF MAIN ENTRANCE.

Name of contractor: The L. P. & J. A. Smith Company, Cleveland, Ohio.
Date of contract: November 19, 1902.
Date of approval: January 9, 1903.
Date of commencement: April 20, 1903.
Date of completion: December 31, 1907.

CONTRACT FOR REPAIRING THE SHORE END OF THE WEST BREAKWATER.

Name of contractor: The Hunkin Brothers Construction Company, Cleveland, Ohio.
Date of contract: May 15, 1905.
Date of approval: June 21, 1905.
Date of commencement: July 8, 1905.
Date of completion: August 25, 1906.

CONTRACT FOR DREDGING IN CLEVELAND HARBOR, OHIO.

Name of contractor: The L. P. & J. A. Smith Company, Cleveland, Ohio.
Date of contract: June 28, 1905.
Date of approval: August 7, 1905.
Date of commencement: July 11, 1905.
Date of completion: December 31, 1906.

COMMERCIAL STATISTICS.

The following statistics for the year 1906 relative to the commerce of the harbor of Cleveland, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Cement	3,759	Cement	821
Coal and coke	29,250	Coal and coke	3,073,500
Copper	633	Flour and provisions	3,379
Fish	3,500	Grain and produce	4,942
Flour and provisions	7,565	Iron ore	38,830
Grain and produce	75,609	Iron, pig and manufactures of	39,345
Iron ore	7,461,495	Lumber, logs, etc	82
Iron, pig	12,299	Petroleum	52,050
Iron, manufactures of	883	Stone, lime, and sand	4,043
Lumber, logs, etc	493,470	Salt	222
Salt	548	Miscellaneous	615,769
Stone, lime, and sand	236,451		
Miscellaneous	89,181		
Total	8,414,643	Total	3,832,983

Total freight tonnage:

1906	12,247,626
1905	11,419,797
Increase	827,829

Vessels.	Number.	Tonnage.
Entering	5,020	7,347,785
Departing	4,978	6,957,628
Built	10	25,778

Total registered tonnage (vessels entering and departing):

1906	14,305,413
1905	10,691,857
Increase	3,613,556

Draft of largest vessels using harbor, 24 feet.
Largest vessels do not load to full depth.
No new vessel lines established during the year.

Q Q 8.

IMPROVEMENT OF FAIRPORT HARBOR, OHIO.

For a description of the location, projects of improvement, and the general conditions at this harbor, see pages 2676 and 2677, Report of the Chief of Engineers for 1898.

The reasons for extending the west breakwater to the shore and discussed in the Annual Report of the Chief of Engineers for 1903, pages 2084 to 2087, inclusive, and the form of breakwater as adopted described in the report for 1905, page 2349.

Work has been in progress during the year on the construction of the shore end of the west breakwater, under a contract with the Federal Contracting Company, of New York, dated July 29, 1905. The work consists of joining the inner end of the existing timber crib west breakwater with the shore by means of a rubble mound structure 1,500 feet long. Work was commenced on August 23, 1905, and was 74 per cent completed at the close of the fiscal year.

A detailed statement of the work done during the year and the totals to date is shown in the following table:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Fascine mattress ..... squares..	$26.00	26.9	$699.40	164.4	$4,274.40
Large placed stone ..... tons..	2.00	12,887.4	25,774.80	15,650	31,300.00
Quarry run stone ..... do....	1.65	3,580.7	5,908.15	11,381.6	18,779.64
Small riprap stone ..... do....	1.50	11,323.7	16,985.55	20,294.2	30,441.30
Total	.....	.....	49,367.90	.....	84,795.34

This contract expired November 30, 1906, but was extended for a reasonable period. The outer 600 feet and the inner 900 feet have been practically completed, leaving a length of 200 feet which is built up above the water surface.

The usual bar formation at the entrance to this harbor during the winter was removed by the U. S. dredge *Burton* between April 3 and May 9, 1907. A total of 34,248 cubic yards were removed at a field cost of $2,911.45.

The following is a statement of expenditures made on account of improving harbor at Fairport, Ohio, during the fiscal year 1907:

General administration:		
Office and engineering	$1,311.00	
Travel and miscellaneous	37.76	
Repair of steamer *Visitor*	366.67	
		$1,715.43
Construction of breakwater (Federal Contracting Company):		
Paid to contractor	41,290.47	
Inspection and services	1,882.00	
		43,172.47
Dredging (U. S. dredge *Burton*):		
Services	1,843.97	
Supplies	611.93	
Repairs	228.13	
Subsistence	227.42	
		2,911.45
Total expended		47,799.35

Money statement.

July 1, 1906, balance unexpended		$133,877.98
Amount appropriated by river and harbor act approved March 2, 1907		100,000.00
Collections on account of damages to dredge *Burton*		106.94
		233,984.92
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$44,887.90	
For maintenance of improvement	2,911.45	
		47,799.35
July 1, 1907, balance unexpended		186,185.57
July 1, 1907, outstanding liabilities		10,377.67
July 1, 1907, balance available		175,807.90
July 1, 1907, amount covered by uncompleted contracts		37,705.78
Amount (estimated) required for completion of existing project		245,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$100,000.00	
For maintenance of improvement	10,000.00	
		110,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

May 3, 1825	$1,000.00	July 5, 1884	$10,000.00
May 20, 1826	5,620.00	August 5, 1886	18,750.00
May 19, 1828	9,135.11	August 11, 1888	10,000.00
April 23, 1830	5,563.18	September 19, 1890	30,000.00
March 2, 1831	5,680.00	July 13, 1892	35,000.00
July 3, 1832	2,600.00	August 8, 1894	5,059.96
June 28, 1834	10,000.00	August 18, 1894	20,000.00
July 2, 1836	6,000.00	June 3, 1896	30,000.00
July 7, 1838	10,000.00	March 3, 1899	100,000.00
June 11, 1844	10,000.00	July 31, 1900 (allotment)	3,000.00
August 13, 1852	10,000.00	April 15, 1902 (allotment)	1,800.00
June 28, 1864	24,453.24	June 13, 1902	200,000.00
June 3, 1866	24,072.00	March 3, 1905	135,000.00
March 2, 1867	60,000.00	Received from other sources	208.44
June 23, 1874	20,000.00	March 2, 1907	100,000.00
March 3, 1875	15,000.00		
August 14, 1876	5,000.00		
June 18, 1878	5,000.00	Total	950,941.93
June 14, 1880	3,000.00	Expended to June 30, 1907	764,756.36
March 3, 1881	10,000.00		
August 2, 1882	10,000.00		186,185.57

CONTRACTS IN FORCE.

CONTRACT FOR CONSTRUCTING SHORE END OF WEST BREAKWATER.

Name of contractor: The Federal Contracting Company, New York.
Date of contract: July 29, 1905.
Date of approval: August 29, 1905.
Date of commencement: August 23, 1905.
Date of completion: November 30, 1906.
Extended for a reasonable period.

COMMERCIAL STATISTICS.

The following statistics for the year 1906, relative to the commerce of the harbor of Fairport, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Coal and coke	3,400	Coal and coke	321,671
Copper	5,364	Iron, pig, and manufactures of	8,796
Fish	100	Miscellaneous	10,315
Flour and provisions	64,309		
Grain and produce	25,246		
Iron ore	2,052,538		
Iron, pig	24,920		
Lumber, logs, etc	662		
Stone, lime, and sand	23,572		
Miscellaneous	34,125		
Total	2,234,236	Total	340,782

Total freight tonnage:	
1906	2,575,018
1905	2,680,173
Decrease	105,155

Vessels.	Number.	Tonnage.
Entering	511	1,222,921
Departing	512	1,202,194

Total registered tonnage:	
1906	2,425,115
1905	2,515,988
Decrease	90,873

Draft of largest vessels using harbor, 24 feet.
Largest vessels do not load to full depth.
No new vessel lines established during the year.

Q Q 9.

IMPROVEMENT OF ASHTABULA HARBOR, OHIO.

For a description of the localities, original conditions, and the various projects of improvement see page 2679 of the Report of the Chief of Engineers for 1898.

The present project was adopted in 1896, and was originally carried on under a continuous contract, approved June 22, 1900, with the Donnelly Contracting Company, of Buffalo, N. Y., for the construction of the two detached breakwaters provided for in the project.

After the work was about 63 per cent completed the contractors failed and a new contract was made with their sureties, the United States Fidelity and Guaranty Company, which contract was approved October 11, 1905. The contractors have made very poor progress, the work now being 77 per cent completed, an advance of 7¾ per cent for the year.

The cross section of these breakwaters has also been modified by supplemental agreement in accordance with the findings of the Board of Engineer Officers, March 23, 1907.

The following table gives a detailed statement of the work:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Two pier heads (complete)					$36,058.17
West breakwater.					
Heavy riprap ....tons..	$1.43	909.75	$1,300.94	40,583	58,033.70
Core filling....do....	.77	291	224.07	70,065.5	53,950.44
Small stone....do....	1.16	1,363.5	1,581.66	48,517	56,279.72
Paving stone....do....	2.09	574	1,199.66	5,373	11,229.57
Total			4,306.33		179,493.43
East breakwater.					
Heavy riprap ....tons..	1.43	173	247.39	16,479.5	23,565.68
Core filling....do....	.77	4,155.2	3,199.50	44,667.2	34,393.74
Small stone....do....	1.16	13,439.8	15,590.17	31,516.8	36,559.49
Quarry run stone....do....	1.43	6,499.7	9,294.57	6,499.7	9,294.57
Total			28,331.63		103,813.48
Grand total			32,637.96		319,365.08

Under this contract the pierheads and 300 linear feet of the west breakwater has been completed and 1,050 feet built up to the water surface. One hundred and thirty linear feet of the east breakwater has been completed and 1,050 feet built up to about the water surface.

A contract is also in force with the Federal Contracting Company, dated August 29, 1905, for the construction of the shoreward end of the west breakwater.

The following table gives a detailed statement of the work accomplished:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Large placed stone....tons..	$1.80	4,477.4	$8,059.32	4,724.4	$8,503.92
Quarry run stone....do....	1.42	12,664.8	17,984.02	40,641.8	57,711.35
Shale....cubic yards..	.70	8,334.5	5,834.15	20,993.5	14,695.45
Sand....do....	.40	8,033.1	3,213.24	12,687.1	5,074.84
Total			35,090.73		85,985.56

The large placed stone paving has been completed for 120 linear feet, and up to 4 feet above mean lake level for 140 linear feet; the remainder of the structure is up to —3 feet, completing 60.3 per cent of the contract.

A survey of the harbor made in March showed a slight shoaling in the entrance channel. The U. S. dredge *Burton* was accordingly sent to Ashtabula, and between May 24 and June 2 restored the channel to ample width and depth, removing 5,099 cubic yards of material.

In 1904 the Secretary of War, under authority of law, gave permission to the Pittsburgh, Youngstown and Ashtabula Railroad Company to completely remove the west jetty and to replace the

same by a bulkhead 60 feet farther to the west, thus increasing the width of the channel. Under the authority granted by this permit the railroad company has completed 1,120 feet of new dock composed of stone-filled timber crib substructure and concrete superstructure, has made an extensive fill on the lake front and to the westward of the new dock, reclaiming about 16 acres, and has removed all of the old west pier to depth of 20 feet, making the width of the channel about 300 feet.

In May, 1906, authority was also granted to the Lake Shore and Michigan Southern Railway Company to make certain improvements on the westerly side of the river. The railroad company is to take possession of the east pier and to extend it northward 720 feet. Thence there will be an extension of about 900 feet easterly, thence southward to meet the property of the railway company. The inclosure will be filled to the level of the dock. The Government east breakwater will afford but partial protection to these new docks. The railroad company has been authorized to extend the east breakwater to protect the docks on the easterly side. Work on this improvement was begun in June, 1906, and has since been pushed vigorously.

In connection with these developments and for the protection of navigation interests harbor lines have been established in the jettied channel and outer harbor. These lines received the approval of the Secretary of War June 21, 1907.

The following is a statement of expenditures made on account of improving harbor at Ashtabula, Ohio, during the fiscal year 1907:

General adminjstration:		
Examinations and surveys	$317.90	
Office and engineering	1,676.12	
Travel and miscellaneous	110.05	
Purchase and repair of plant	150.92	
Care and repair of storehouse	177.75	
Operation and repair of launch *Ariel*	158.92	
Repair of steamer *Visitor*	366.67	
		$2,958.33
Costruction of piers and breakwaters (contractors, Federal Contracting Company and the United States Fidelity and Guaranty Company):		
Paid to Federal Contracting Company	30,968.49	
United States Fidelity and Guaranty Company	23,249.04	
Repair of pierhead	27.64	
Repair of west breakwater	34.17	
Inspection and services	5,766.34	
		60,045.68
Dredging (U. S. dredge *Burton*):		
Services	826.64	
Supplies	252.10	
Repairs	62.91	
Subsistence	247.45	
		1,389.10
Total expended		64,393.11

Money statement.

July 1, 1906, balance unexpended		$307,263.56
Amount appropriated by river and harbor act approved March 2, 1907		20,000.00
Receipts from sales		6.00
		327,269.56
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$63,004.01	
For maintenance of improvement	1,389.10	
		64,393.11
July 1, 1907, balance unexpended		262,876.45
July 1, 1907, outstanding liabilities		14,458.65
July 1, 1907, balance available		248,417.80
July 1, 1907, amount covered by uncompleted contracts		183,370.88
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907		10,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

May 26, 1826	$12,000.00	July 5, 1884	$22,500.00
May 19, 1828	2,403.50	August 5, 1886	30,000.00
March 3, 1829	6,940.25	August 11, 1888	25,000.00
March 2, 1831	7,015.00	September 19, 1890	40,000.00
July 3, 1832	3,800.00	July 13, 1892	70,000.00
March 2, 1833	3,400.00	August 18, 1894	75,000.00
June 28, 1834	5,000.00	June 3, 1896	50,000.00
March 3, 1835	7,591.00	March 3, 1899	50,000.00
March 3, 1837	8,000.00	June 6, 1900	110,000.00
July 7, 1838	8,000.00	July 2, 1900 (allotment)	3,000.00
June 11, 1844	5,000.00	March 3, 1901	2,000.00
August 30, 1852	10,000.00	April 30, 1901 (allotment	2,858.45
March 3, 1853	42.64	June 13, 1902	200,000.00
February 9, 1859	809.65	June 28, 1902	200,000.00
June 23, 1866	24,708.82	March 3, 1903	118,000.00
March 2, 1867	54,000.00	March 3, 1905	20,000.00
March 3, 1871	15,000.00	Received from other sources	3,533.75
June 10, 1872	15,000.00	March 2, 1907	20,000.00
March 3, 1873	16,000.00		
June 23, 1874	35,000.00		
March 3, 1875	25,000.00		
August 14, 1876	5,000.00	Total	1,392,603.06
June 18, 1878	12,000.00	Expended to June 30, 1907	1,129,726.61
March 3, 1879	9,000.00		
June 14, 1880	20,000.00		262,876.45
March 3, 1881	20,000.00		
August 2, 1882	20,000.00		

CONTRACTS IN FORCE.

CONTRACT FOR CONSTRUCTING EAST AND WEST BREAKWATERS.

Name of contractor: The United States Fidelity and Guaranty Company, Baltimore.

Date of contract: August 26, 1905.

Date of approval: October 11, 1905.

Date of commencement: August 20, 1905.

Date of completion: December 1, 1906.

Extended for a reasonable period.

CONTRACT FOR CONSTRUCTING SHOREWARD END OF WEST BREAKWATER.

Name of contractor: The Federal Contracting Company, New York.
Date of contract: July 29, 1905.
Date of approval: August 29, 1905.
Date of commencement: August 11, 1905.
Date of completion: November 30, 1906.
Extended for a reasonable period.

COMMERCIAL STATISTICS.

The following statistics for the year 1906 relative to the commerce of the harbor of Ashtabula, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Fish	300	Coal and coke	2,512,867
Iron ore	7,651,069	Iron ore	3,192
Iron, pig	86,704	Iron, pig, and manufactures of	871
Lumber, logs, etc	948	Miscellaneous	438
Stone, lime, and sand	57,100		
Miscellaneous	640		
Total	7,796,761	Total	2,517,368

Total freight tonnage:	
1906	10,314,129
1905	9,250,691
Increase	1,063,438

Vessels.	Number.	Tonnage.
Entering	1,772	4,445,428
Departing	1,807	4,612,787

Total registered tonnage:	
1906	9,058,215
1905	7,897,093
Increase	1,161,122

Draft of largest vessels using harbor, 24 feet.
Largest vessels do not load to full depth.
No new vessel lines established during the year.

Q Q 10.

IMPROVEMENT OF CONNEAUT HARBOR, OHIO.

The project for the improvement of this harbor was adopted in 1896, and is given in ful on pages 2970 and 2971 of the Report of the Chief of Engineers for that year.

After completing 71 per cent of the contract for the construction of the breakwaters and the extension and reconstruction of parts of the east and west piers, The Donnelly Contracting Company, of Buffalo, N. Y., failed; and a contract approved October 3, 1905, for completing the work was awarded to their sureties, The Empire State

Surety Company, of New York. Work under this contract was entirely completed March 11, 1907.

The following table gives a detailed statement of the work done under this contract:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Timber crib and concrete piers.					
Dredging ..... cubic yards..	$0.29	.....	.....	66,020	$19,145.80
Old pier removed ..... linear feet..	5.00	.....	.....	518	2,590.00
Small riprap stone ..... tons..	1.33	146	$194 18	24,392.5	29,782.03
Old pile revetment removed ... linear feet..	6.00	.....	.....	412	2,472.00
Rock and shale removed ..... cubic yards..	1.55	.....	.....	280	434.00
Heavy riprap stone ..... tons..	1.65	.....	.....	1,141	1,882.65
Concrete blocks ..... cubic yards..	10.00	111.2	1,112.00	3,196	31,960.00
Concrete in mass ..... do....	7.40	401.7	2,972.58	8,613	63,736.20
Crib structures	.....	.....	.....	.....	74,550.52
Oak fenders ..... M. feet..	65.00	1,264	82.16	22,288	1,448.72
Nuts, washers, and sleeves ..... pounds..	.04	700	28.00	10,689	427.56
Lag screws and washers ..... do....	.04	3,609	144.36	22,379	895.16
Driftbolts ..... do....	.04	47	1.88	5,013	200.52
Spikes ..... do....	.04	14	.56	216	8.64
Hemlock timber ..... M. feet..	65.00	555	36.08	23,436	1,523.35
Hardwood sheathing ..... do....	124.00	9,906	1,228.34	59,550	7,384.20
Old superstructure removed ... linear feet..	4.00	.....	.....	994	3,976.00
Timber crib breakwater, except lag screws.	.....	.....	.....	.....	25,605.49
Lag screws and washers ..... pounds..	.04	704	28.16	3,227	129.08
Timber crib and concrete, east breakwater.					
Heavy riprap stone ..... tons..	1.60	.....	.....	5,289	8,462.40
Small riprap stone ..... do....	1.30	313	406.90	14,787	19,223.10
Crib structures	.....	.....	.....	.....	36,354.82
Concrete blocks ..... cubic yards..	9.90	210.5	2,083.95	1,053.8	10,432.62
Concrete in mass ..... do....	7.00	620.9	4,346.30	3,592.2	25,145.40
Oak fenders ..... M. feet..	50.00	3,062	153.10	3,062	153.10
Bolts, washers, and sleeves ..... pounds..	.0355	1,766	62.69	1,766	62.69
Two pierheads.					
Heavy riprap stone ..... tons..	1.65	.....	.....	1,735	2,862.76
Small riprap stone ..... do....	1.33	818	1,087.94	4,649	6,183.17
Concrete blocks ..... cubic yards..	10.00	385	3,850.00	385	3,850.00
Concrete in mass ..... do....	7.25	746	5,408.51	746	5,408.51
Paving stone ..... tons..	5.00	65	325.00	65	325.00
Oak fenders ..... M. feet..	50.00	2,058	102.90	2,058	102.90
Bolts, washers, and sleeves ..... pounds..	.04	1,423	56.92	1,423	56.92
Iron pipe ..... do....	.50	275	137.50	275	137.50
Crib structures	.....	.....	.....	.....	13,216.16
Total	.....	.....	23,850.01	.....	400,128.97

A contract was awarded to the Great Lakes Construction Company, of Buffalo, N. Y., approved May 7, 1906, for construction of 256 linear feet of shoreward end of the east breakwater. Work on this contract was completed May 4, 1907.

The following table gives a detailed statement of this contract:

	Contract price.	Fiscal year 1907.		Total to date.	
		Quantity.	Cost.	Quantity.	Cost.
Hemlock timber ..... M feet..	$34.00	301,850	$10,262.90	301,850	$10,262.90
Oak timber ..... do....	65.00	1,544	100.36	1,544	100.36
Beech sheathing ..... do....	46.00	25,728	1,183.49	25,728	1,183.49
Tie rods and washers ..... pounds..	.04	21,928	877.12	21,928	877.12
Driftbolts ..... do....	.04	19,848	793.92	19,848	793.92
Lag screws and washers ..... do....	.04	21,922	876.88	21,922	876.88
Screw bolts and washers ..... do....	.04	25,964	1,038.56	25,964	1,038.56
Spikes ..... do....	.04	1,008	40.32	1,008	40.32
Concrete blocks ..... cubic yards..	11.00	429.3	4,722.30	429.3	4,722.30
Concrete, mass ..... do....	8.00	1,233.6	9,868.80	1,233.6	9,868.80
Small riprap stone ..... tons..	1.40	4,553	6,374.20	5,220	7,308.00
Heavy riprap stone ..... do....	1.65	906	1,494.90	906	1,494.90
Dredging ..... cubic yards..	.60	.....	.....	2,025	1,215.00
Total	.....	.....	37,633.75	.....	39,782.55

A survey of the entrance channel made in March, 1907, showed that the channel had been considerably narrowed by shoals on each side. The channel was restored to its usual width and depth by the U. S. dredge *Burton* between May 10 and 23 by the removal of 14,291 cubic yards of material, at a field cost of $1,570.62.

The following is a statement of expenditures made on account of improving harbor at Conneaut, Ohio, during the fiscal year 1907:

General administration:		
Office and engineering	$1,578.00	
Travel and miscellaneous	77.27	
Examinations and surveys	230.00	
Purchase and repair of plant	17.04	
		$1,902.31
Repair of piers (open market):		
Great Lakes Construction Company	960.14	
Materials	23.36	
		983.50
Construction of breakwaters and piers (contracts Empire State Surety Company and Great Lakes Construction Company):		
Paid to Empire State Surety Company	$42,396.62	
Paid to Great Lakes Construction Company	39,524.22	
Inspection and services	3,657.49	
		85,578.33
Dredging (U. S. dredge *Burton*):		
Services	666.67	
Supplies	554.35	
Repairs	22.93	
Subsistence	326.67	
		1,570.62
Operation and maintenance of U. S. steamer *Visitor*:		
Repairs	366.66	
Supplies	20.80	
Subsistence	2.08	
		389.54
Total expended		90,424.30

Money statement.

July 1, 1906, balance unexpended		$136,822.91
Amount appropriated by river and harbor act approved March 2, 1907		20,000.00
Receipts for sales		.13
		156,823.04
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$87,870.18	
For maintenance of improvement	2,554.12	
		90,424.30
July 1, 1907, balance unexpended		66,398.74
July 1, 1907, outstanding liabilities		11,463.53
July 1, 1907, balance available		54,935.21
July 1, 1907, amount covered by uncompleted contracts		11,357.58

APPROPRIATIONS.

March 3, 1829	$7,500.00	June 3, 1896	$40,000.00
April 23, 1830	6,135.65	March 3, 1899	100,000.00
March 2, 1831	6,370.00	July 2, 1900 (allotment)	3,000.00
July 2, 1832	7,800.00	March 20, 1901 (allotment)	2,068.20
July 2, 1836	2,500.00	June 13, 1902	200,000.00
March 3, 1837	5,000.00	March 3, 1903	10,000.00
July 7, 1838	8,000.00	April 28, 1904	240,000.00
June 11, 1844	5,000.00	March 3, 1905	60,000.00
August 30, 1852	10,000.00	Redeposited November 22, 1904	1,000.00
June 23, 1866	20,513.74	Received from other sources	850.63
March 2, 1867	10,000.00	March 2, 1907	20,000.00
April 10, 1869 (allotment)	8,910.00		
June 11, 1870	6,000.00	Total	869,548.22
March 3, 1873	400.00	Expended to June 30, 1907	803,149.48
June 23, 1874	1,500.00		
March 3, 1875	1,000.00		66,398.74
June 14, 1880	6,000.00		
July 13, 1892	40,000.00		
August 18, 1894	40,000.00		

CONTRACTS IN FORCE.

CONTRACT FOR CONSTRUCTION OF BREAKWATERS, THE EXTENSION OF AND THE RECONSTRUCTION OF THE EAST AND WEST PIERS.

Name of contractor: The Empire State Surety Company, New York.
Date of contract: August 28, 1905.
Date of approval: October 3, 1905.
Date of commencement: August 18, 1905.
Date of completion: March 11, 1907.

CONTRACT FOR CONSTRUCTION OF 256 LINEAR FEET OF SHOREWARD END OF THE EAST BREAKWATER.

Name of contractor: The Great Lakes Construction Company, Buffalo, N. Y.
Date of contract: April 14, 1906.
Date of approval: May 7, 1906.
Date of commencement: June 4, 1906.
Date of completion: Close of working season.
Extended for a reasonable period.

COMMERCIAL STATISTICS.

The following statistics for the year 1906, relative to the commerce of the harbor of Conneaut, Ohio, were compiled from information furnished by the collector of customs and others:

Receipts.	Tons.	Shipments.	Tons.
Flour and provisions	111	Coal and coke	885,633
Grain and produce	1,879	Iron, pig, and manufactures of	69,727
Iron ore	6,084,254	Lumber, logs, etc.	25
Iron, pig	1,054	Miscellaneous	3,369
Iron, manufactures of	1,716		
Lumber, logs, etc.	341		
Stone, lime, and sand	12,861		
Miscellaneous	2,099		
Total	6,104,315	Total	958,754

Total freight tonnage:	
1906	7,063,069
1905	6,556,282
Increase	506,787

Vessels.	Number.	Tonnage.
Entering	1,610	4,082,496
Departing	1,597	4,049,350

Total registered tonnage:	
1906	8,131,846
1905	7,504,037
Increase	627,809

Draft of largest vessels using harbor, 24 feet.
Large vessels do not load to full depth.
No new vessel lines established during the year.

Q Q 11.

REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

Car ferry Shenango No. 1.—The removal of this wreck, under contract with Van Sant & Boehm was completed in June, 1907, and the harbor restored to its original condition.

Tow barge Yukon.—In July, 1907, under an oral agreement with Charles R. Dittrick, of Cleveland, Ohio, the wreck was leveled off to a depth of 30 feet, at a cost of $400.

Steamer Lucille.—This vessel was abandoned by owner, and on October 27 a contract was entered into with A. Q. Thatcher & Co., of Toledo, Ohio, for her complete removal, at a cost of $1,075. The removal was successfully accomplished in December, 1906, at a cost of $1,400.

Schooner Algeria.—After removing her cargo of iron ore the owners abandoned her. A contract was entered into on September 20, 1906, with Charles R. Dittrick, of Cleveland, to remove the wreck to a clear depth of 28 feet for the sum of $800. The removal was accomplished in October, at a total cost of $1,000.

Steamer Crosthwaite.—This vessel was abandoned by owner. After due notice, no bids being received, the wreck was removed during November, 1906, to clear depth of 23 feet by the U. S. dredge *Maumee*, at a total cost of $2,000.

Steamer City of Concord.—The masts and rigging were removed to a clear depth of 30 feet by the U. S. steamer *Visitor* in November, 1906, at a total cost of $100.

Tug McCormick.—An allotment of $1,500 has been made for the removal of the wreck, and specifications for doing the work by contract have been forwarded to the Chief of Engineers for approval.

CONTRACT IN FORCE.

CONTRACT FOR REMOVAL OF WRECK OF THE CAR FERRY SHENANGO NO. 1.

Name of contractor: Van Sant & Boehm, Atlantic City, N. J.
Date of contract: July 17, 1905.
Date of approval: August 5, 1905.
Date of commencement: August 26, 1905.
Date of completion: Close of working season of 1906.
Extended for a reasonable period.

APPENDIX R R.

IMPROVEMENT OF ERIE HARBOR, PENNSYLVANIA, AND OF CERTAIN RIVERS AND HARBORS IN WESTERN NEW YORK.

REPORT OF COL. H. M. ADAMS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Erie Harbor, Pennsylvania.
2. Dunkirk Harbor, New York.
3. Buffalo Harbor, New York.
4. Lake Erie entrance to Black Rock Harbor and Erie Basin, New York.
5. Buffalo entrance to Erie Basin and Black Rock Harbor, New York.
6. Black Rock Harbor and channel, New York.
7. Tonawanda Harbor and Niagara River, New York.

UNITED STATES ENGINEER OFFICE,
Buffalo, N. Y., July 9, 1907.

GENERAL: I have the honor to forward herewith reports of operations * * * on river and harbor works in this district, during the year ending June 30, 1907.

Very respectfully, your obedient servant,

H. M. ADAMS,
Colonel, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

R R 1.

IMPROVEMENT OF HARBOR AT ERIE, PENNSYLVANIA.

REPORT OF OPERATIONS.

At the beginning of the fiscal year work of channel and basin excavation under contract with the Lake Erie Dredging Company had been nearly completed.

It was completed July 9, 1906, the total material excavated and removed being—

Basin section, cubic yards, place measure	189,050
Channel section, cubic yards, scow measure	8,069

at a cost of $49,118.37, exclusive of office and engineering expenses.

This work restored the entrance channel to the full project depth of 20 feet at mean lake level, and extended the harbor basin, having the same depth, easterly to the west line of the Pennsylvania Ore Dock.

During the fiscal year work of extending the south pier 500 feet and replacing with concrete 750 feet of timber superstructure on north pier, under contract with William H. Shelton, was continued.

The extension of the south pier was completed April 30, 1907, and at the close of the fiscal year the north pier work was in progress.

A contract has been made with the Great Lakes Dredge and Dock Company for the further extension of the south pier 500 feet, and for replacing with stone the timber superstructure on 1,200 feet of the south breakwater.

CONDITION OF THE WORKS.

The north pier is in good condition, except 750 linear feet of timber-crib pier built prior to 1883 and badly decayed, and reconstruction of the superstructure with concrete is in progress.

The south pier is in good condition and will be extended 500 feet under contract now in force.

The entrance channel and harbor basin are in fair condition. Dredging of the basin to 20 feet depth is finished and the channel is of the required depth of 20 feet and width of 300 feet.

The preservation of the peninsula is of vital importance to Erie Harbor, and it is for the purpose of preserving the harbor that the protection of the weak parts of the peninsula has been deemed necessary. The weakest portion is the long, narrow neck at the western end, and works of protection have been constructed to prevent a breach through this narrow neck. The danger exists during severe storms from the westward.

The protection works for the neck consist of the remains of a shore protection constructed in 1889, which affords little or no protection, and the tree growth propagated and maintained on the neck. During 1896–1898 about 6,600 young locust and willow trees were planted on the neck of the peninsula. Most of these have grown finely, but some of the outer ones have been washed out by heavy seas.

The beach erosion along the body of the peninsula has not been materially corrected by jetties built out from the shore. At the present time there is one dilapidated jetty at the easterly end, no longer of service, and three jetties about the middle of the peninsula shore, one of which belongs to the Light-House Establishment, in fair condition.

A severe storm on January 20, 1907, made some changes in the shore lines of the peninsula, but no serious damage was done.

PROPOSED OPERATIONS AND REMARKS.

The extension of the south pier 500 feet under contract with the Great Lakes Dredge and Dock Company will complete the project of March 3, 1899, except for maintenance, and protection of Presque Isle Peninsula.

Funds for these purposes are on hand, and no estimate is made for the next fiscal year.

Money statement.

July 1, 1906, balance unexpended		$100,355.00
Amount appropriated by river and harbor act approved March 2, 1907		120,000.00
		220,355.00
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$28,343.79	
For maintenance of improvement	21,282.43	
		49,626.22
July 1, 1907, balance unexpended		170,728.78
July 1, 1907, amount covered by uncompleted contracts		86,355.86

APPROPRIATIONS AND ALLOTMENTS.

1823	$150.00	June 23, 1874	$20,000.00
May 26, 1824	20,000.00	March 3, 1875	80,000.00
May 25, 1826	7,000.00	August 14, 1876	40,000.00
March 2, 1827	2,000.00	June 16, 1878	25,000.00
May 19, 1828	6,223.18	March 3, 1879	25,000.00
March 3, 1829	7,390.25	June 14, 1880	25,000.00
March 2, 1831	1,700.00	March 3, 1881	20,000.00
July 3, 1832	4,500.00	August 2, 1882	20,000.00
March 2, 1833	6,000.00	July 5, 1884	50,000.00
June 28, 1834	23,045.00	August 5, 1886	37,500.00
March 3, 1835	5,000.00	August 11, 1888	83,000.00
July 2, 1836	15,122.80	September 19, 1890	40,000.00
March 3, 1837	15,000.00	1891 (received from sales)	4,716.89
July 7, 1838	30,000.00	July 13, 1892	40,000.00
June 11, 1844	40,000.00	August 18, 1894	10,000.00
August 30, 1852	30,000.00	March 3, 1899	125,000.00
1864 (allotment)	15,000.00	June 13, 1902	125,000.00
June 23, 1866	36,961.00	March 3, 1905	125,000.00
March 2, 1867	25,000.00	1904 (received from sales)	6.00
1868 (allotment)	40,000.00	March 2, 1907	120,000.00
1869 (allotment)	22,275.00		
June 11, 1870	20,000.00		
March 3, 1871	29,000.00		
1871 (allotment)	10,000.00		
June 10, 1872	15,000.00	Total	1,441,590.12

CONTRACTS IN FORCE.

FOR EXTENDING SOUTH PIER AND CONCRETE SUPERSTRUCTURE ON NORTH PIER AT ERIE HARBOR, PENNSYLVANIA, DATED JUNE 8, 1905.

Name of contractor: William H. Shelton, Dunkirk, N. Y.

Rates, extending south pier:

Dredging for foundation, per cubic yard scow measure	$0.40
Foundation stone, per cubic yard	2.00
Riprap stone, per cubic yard	3.00
Timber cribs filled with stone and leveled, per linear foot	36.55
Concrete blocks, per cubic yard	10.95
Filling stone in superstructure, per cubic yard	2.00
Mass concrete, per cubic yard	8.95
Manhole covers, per cover	4.50

Concrete superstructure on north pier:

Removing old superstructure, per linear foot	$7.50
New hemlock timber above 4 feet below mean lake level, per 1,000 feet B. M	65.00
New hemlock timber below 4 feet below mean lake level, per 1,000 feet B. M	100.00
New white-oak piles, per pile	7.00
New stone filling in concrete superstructure, per cubic yard	2.50
Concrete blocks, set in place, per cubic yard	10.95
Concrete blocks, molded in place, per cubic yard	9.25
Mass concrete in place, per cubic yard	8.95
Manhole covers, per cover	4.50
Mooring posts, per post	22.50
White-oak fenders, per fender	4.65

Date of approval: June 15, 1905.
Date of commencement: July 17, 1905.
Date of expiration: June 30, 1907.
Time limit waived.

FOR EXTENDING SOUTH PIER AND STONE SUPERSTRUCTURE ON SOUTH BREAKWATER AT ERIE HARBOR, PENNSYLVANIA, DATED JUNE 29, 1907.

Name of contractor: Great Lakes Dredge and Dock Company, Chicago, Ill.

Rates, extending south pier:

Dredging for foundation, per cubic yard scow measure	$1.00
Foundation stone, per cubic yard	2.10
Riprap stone, per cubic yard	2.10
Timber cribs filled with stone and leveled, per linear foot	48.90
Concrete blocks, per cubic yard	10.00
Mass concrete, per cubic yard	8.65
Filling stone in superstructure, per cubic yard	2.10
Manhole covers, per cover	7.90

Stone superstructure on south breakwater:

Removing old superstructure, per linear foot	3.00
Rubble and paving stone, per ton of 2,000 pounds	3.10

Date of approval: July 11, 1907.
Date of commencement: August 15, 1907.
Date of completion: December 31, 1908.
Total amount of contract, $58,766.15.

COMMERCIAL STATISTICS.

Arrivals and departures of vessels for the year ending December 31, 1906.

Vessels.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Steam	1,034	2,088,892	115	55,372	1,023	2,031,060	139	89,787
Sail and barges	96	57,902	45	14,788	71	117,118	56	22,845
Total	1,130	2,146,794	160	70,160	1,094	2,148,178	195	112,632

Total arrivals and departures:	
Number	2,579
Tonnage	4,447,764
Increase of tonnage, 1906 over 1905	343,305
Amount of revenue collected, year 1906:	
Lake commerce	$2,770.75
Rail commerce	$4,264.75
Value of imports:	
Lake	$81,207.00
Rail	$20,159.00
Value of exports: Lake	$357,830.00
Enrolled tonnage, port of Erie, Pa gross tons	53,894
Greatest draft of vessels feet	19.4

Receipts and shipments by lake.

RECEIPTS.

[Tons of 2,000 pounds.]

	1902.	1903.	1904.	1905.	1906.
Merchandise	78,342	89,141	82,168	148,091	145,125
Barley	2,277	6,863	4,776	1,408	282
Corn	841	95,849	10,917	19,535	41,225
Rye	.....	10,233	3,501	.....	.....
Wheat	44,162	33,588	29,858	41,515	113,734
Flaxseed	.....	.....	.....	6,943	3,056
Flour	180,982	166,631	84,790	148,091	164,363
Lumber	23,085	17,903	21,012	16,431	19,182
Lath	77	115	124	.....	240
Poles and stave bolts	.....	12	80	.....	.....
Ties	.....	732	.....	.....	.....
Iron ore	1,934,933	1,257,798	1,467,805	2,377,213	2,486,518
Copper	5,465	12,975	6,655	4,489	8,290
Lead	2,239	2,973	1,244	8,411	272
Stone	.....	2,700	.....	7,750	3,610
Fish	.....	3,800	4,009	4,469	2,100
Pulp wood	32,400	16,988	9,225	29,766	28,396
Total	2,304,803	1,718,301	1,726,164	2,814,112	3,016,393

SHIPMENTS.

Anthracite coal	154,432	291,642	233,507	291,900	295,000
Bituminous coal	660,202	533,586	458,044	521,866	833,591
Pig and manufactured iron	1,079	642	.....	.....	.....
Merchandise	105,447	118,788	97,752	132,350	142,246
Total	921,160	944,658	784,303	946,116	1,270,837

R R 2.

IMPROVEMENT OF HARBOR AT DUNKIRK, NEW YORK.

REPORT OF OPERATIONS.

At the beginning of the fiscal year work of repairing concrete apron on the west pier, under contract with William H. Shelton, was in progress. This work was completed August 30, 1906, at a total cost of $1,445.42, exclusive of office and engineering expenses.

Repairs were made by hired labor to the timber portions of the pier and breakwater and completed August 30, 1906, at a cost of $1,094.65.

Preparations have been made for extensive repairs to structures during the season of 1907, and the work has been begun by day labor.

CONDITION OF THE WORKS.

The west pier is in poor condition, repairs being badly needed. The breakwater is in poor condition, the old part—1,341 feet long—being much decayed.

Both structures were damaged by storm January 20, 1907, and repairs are now in progress.

PROPOSED OPERATIONS AND REMARKS.

The work outlined in the adopted project for Dunkirk Harbor has been completed, except maintenance.

It is proposed, with the money on hand, to maintain the structures and channel as far as funds will permit.

The commerce of Dunkirk is small and is not increasing.

Money statement.

July 1, 1906, balance unexpended	$21,911.11
June 20, 1907, amount expended during fiscal year, for maintenance of improvement	3,602.30
July 1, 1907, balance unexpended	18,308.81

APPROPRIATIONS AND ALLOTMENTS.

March 27, 1827	$3,000.00	March 3, 1873	$48,132.95
May 19, 1828	6,000.00	June 23, 1874	35,000.00
March 3, 1829	9,812.75	March 3, 1875	35,000.00
April 23, 1830	1,342.75	August 14, 1876	18,000.00
March 2, 1831	7,102.50	1879	2,500.00
July 3, 1832	10,200.00	June 14, 1880	10,000.00
June 28, 1834	4,000.00	July 5, 1884	10,000.00
March 3, 1835	10,988.43	August 5, 1886	20,000.00
July 2, 1836	11,000.00	August 11, 1888	15,000.00
March 3, 1837	15,000.00	September 19, 1890	20,000.00
July 7, 1838	10,000.00	July 13, 1892	20,000.00
June 11, 1844	5,000.00	August 18, 1894	20,000.00
August 30, 1852	30,000.00	June 3, 1896	10,000.00
March 2, 1867	100,000.00	June 22, 1896 (repayment)	250.00
1869	2,000.00	June 4, 1897	398,258.00
July 11, 1870	25,000.00	June 13, 1902	25,000.00
March 3, 1871	25,000.00		
June 10, 1872	25,000.00	Total	987,587.38

COMMERCIAL STATISTICS.

Arrivals and departures of vessels for the year ending December 31, 1906.

Vessel.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Steam	6	3,384	2	757	4	2,256	2	757
Tugs	41	711	6	145	40	1,798	6	214
Sail and barges	2	539	.....	.....	1	273	1	266
Total	49	4,634	8	902	45	4,327	9	1,237

Total arrivals and departures:	
Number	111
Tonnage	11,100
Increase in tonnage, 1906 over 1905 tons	1,597
Amount of revenue collected for the year 1906, rail	$9,597.05
Value of imports, rail	$29,674.89
Receipts by lake, lumber tons	1,130
Enrolled tonnage, port of Dunkirk, N. Y gross tons	555
Greatest darft of vessels feet	16

R R 3.

IMPROVEMENT OF BUFFALO HARBOR, NEW YORK.

REPORT OF OPERATIONS.

Extension of Stony Point section of breakwater.—This extension to have a length of 1,000 feet, running in a northwesterly direction from the north end of the present Stony Point section, at an angle of 150 degrees from the axis of said section, and built of stone; it is called the "south entrance arm."

This was raised to a height of 12 feet below mean lake level with stone excavated from Lake Erie entrance to Black Rock Harbor and Erie Basin, and a contract was made with the Canal Quarry Company, of Buffalo, May 31, 1906, for completion of so much of it as the funds then available, approximately $130,000, would allow.

Work under this contract was commenced July 13, 1906, and at the close of the fiscal year was in progress. About one-half of the rubble stone required under this contract was placed during the year. No capping stone yet placed.

Stone superstructure, sea slope, and riprap on South Harbor section of breakwater.—Contract for this work was made July 25, 1905, with C. M. Handy, Cleveland, Ohio, and work was commenced September 5, 1905.

At the beginning of the fiscal year 13,916.9 tons riprap, 458 tons rubble, and 1,382 tons capping stone had been placed.

Under the terms of the contract the work should have been completed December 31, 1906, but this time limit has been waived for a reasonable period, and at the close of the fiscal year two months' work will be required for completion.

Repairs to breakwater damaged by storm of January 20, 1907.—A severe wind storm on January 20, 1907, damaged the old section of the breakwater for a distance of 1,910 feet, the timber superstructure being practically destroyed. Damage was also done to the decks and walls on other portions of the timber breakwater.

An appropriation of $350,000 was made by the river and harbor act of March 2, 1907, to repair this damage. A project was submitted and approved for placing a stone-concrete superstructure on the 1,910-foot section of the old breakwater, and a contract was made May 31, 1907, with the Great Lakes Construction Company, of Buffalo, the lowest bidder, for this work.

At the close of the fiscal year the work had been started.

Dredging at south end of harbor.—The river and harbor act of March 2, 1907, appropriated $25,000 for dredging at entrance to canals at South Buffalo, in outer harbor.

A project for this work was submitted and approved, and contract was made with the Buffalo Dredging Company, the lowest bidder, June 12, 1907, for the work.

At the close of the fiscal year the work had not been started.

Excavating shoals outside north entrance to harbor.—An appropriation of $56,100 was made by the river and harbor act of March 2, 1907, for excavating rock shoals at entrance of Buffalo Harbor to a depth of 23 feet.

A project for the work was forwarded and approved, and contract was made June 14, 1907, with the Lake Erie Dredging Company, the lowest bidder.

At the close of the fiscal year the work had been started.

Minor repairs.—Repairs to timber portion of breakwater were made by hired labor September 6 to November 15, 1906, at a total cost of $2,050.06.

Material for extensive repairs to timber portion of breakwater damaged by storm of January 20, 1907, were purchased May–June, 1907, and the repairs will be completed during the season of 1907.

The inspection steamer *Thomas Lincoln Casey* was on duty throughout the year on the inspection of operations on harbor works, on the care of floating plant, and on the enforcement of laws for the protection of navigation, notably the dumping of dredgings.

A watchman was on duty throughout the year at the United States engineer storehouse on the south pier for the care of public property, and he also acted as ferryman for employees and supplies to and from the storehouse, and had charge of the automatic water gauge.

The north pier at the entrance to Buffalo River, occupied by the Delaware, Lackawanna and Western Railroad Company, is the only one of the Government harbor works permanently occupied by corporations or private parties.

The occupancy was begun in 1878. A history of this occupancy and copies of official documents relating thereto are given in the Report of the Chief of Engineers for 1889, pages 2373–2383, and in the Report for 1898, page 2775 et seq.

CONDITION OF THE WORKS.

At the close of the fiscal year the condition of the works was as follows:

Entrance piers.—These works, forming the entrance to the inner harbor, which comprises Buffalo Creek and city ship canal, were in fair condition.

The north pier remains in the possession of the Delaware, Lackawanna and Western Railroad Company.

The south pier has a concrete superstructure for its full length and is in good condition.

Breakwater system.—This system comprises four sections of breakwater separated by three entrance channels.

The north breakwater, 2,200 feet long, is a permanent concrete structure and is in good condition.

The old beakwater is 7,608 feet long, of which 4,894 feet is in permanent concrete form and 2,714 feet in timber cribwork. One thousand nine hundred and ten feet of the timber superstructure was wrecked by storm of January 20, 1897, and a contract has been let for its reconstruction with stone and concrete.

The south harbor breakwater is 9,989 feet long. The northerly 7,250 feet is of rubblestone type, a permanent form. The next 360 feet is of timber crib with stone sea slope, and the adjoining 363 feet of timber crib with stone superstructure and sea slope. Following this is 1,800 feet of timber crib with concrete superstructure, and the southerly 216 feet is timber crib with a timber superstructure.

The Stony Point breakwater is 2,803 feet long, connecting with the shore, and is of timber-crib type. This section needs repairs to the deck and wall timbers, and heavy stone riprap to protect it. This work will be done during the season of 1907.

PROPOSED OPERATIONS AND REMARKS.

It is proposed during the next fiscal year, with funds now on hand—

To continue the extension of the Stony Point section of breakwater;

To complete the stone superstructure and sea slope on South Harbor section of breakwater;

To repair the damage done to the breakwater by storm of January 20, 1907, and maintain existing structures;

To excavate the area in front of canals at South Buffalo to a depth of 23 feet at mean lake level;

To remove to a depth of 23 feet the shoals outside north entrance to the harbor;

and during the next fiscal year, or as soon thereafter as possible, it is proposed to widen the Buffalo River entrance channel outside the piers to 400 feet, with a depth of 23 feet at mean lake level, and to remove a rock area at its inner end to the same depth.

No estimate of funds is made for the fiscal year ending June 30, 1909.

Money statement.

July 1, 1906, balance unexpended		$235,219.66
Amount appropriated by river and harbor act approved March 2, 1907		533,436.00
Received from other sources		20.85
		768,676.51
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$15,418.29	
For maintenance of improvement	54,922.20	
		70,340.49
July 1, 1907, balance unexpended		698,336.02
July 1, 1907, amount covered by uncompleted contracts		472,079.73

ALLOTMENT AND APPROPRIATIONS.

May 26, 1826	$15,000.00	June 18, 1878	$80,000.00
May 19, 1828	34,206.00	March 3, 1879	100,000.00
April 23, 1830	15,488.00	June 14, 1880	90,000.00
March 2, 1831	12,900.00	March 3, 1881	90,000.00
July 3, 1832	10,300.00	August 2, 1882	125,000.00
March 2, 1833	31,700.00	July 5, 1884	100,000.00
July 28, 1834	20,000.00	August 5, 1886	112,500.00
July 7, 1838	68,500.00	August 11, 1888	225,000.00
June 11, 1844	40,000.00	September 19, 1890	300,000.00
August 30, 1852	14,000.00	July 13, 1892	300,000.00
March 3, 1853	349.05	August 18, 1894	70,000.00
March 2, 1855	452.32	June 4, 1897	481,250.00
June 28, 1864	15,000.00	July 1, 1898	489,746.00
July 2, 1864	37,500.00	March 3, 1899	485,498.00
June 23, 1866	131,000.00	March 3, 1899	75,000.00
March 2, 1867	100,000.00	March 3, 1901	400,000.00
April 10, 1869	89,100.00	June 13, 1902	30,000.00
July 10, 1870	80,000.00	June 28, 1902	200,000.00
March 3, 1871	100,000.00	March 3, 1905	150,000.00
June 10, 1872	75,000.00	March 3, 1905	143,506.00
March 3, 1873	75,000.00	March 2, 1907	533,436.00
February 23, 1874	20,000.00	Received from other sources	918.35
June 23, 1874	75,000.00		
March 3, 1875	100,000.00		
August 4, 1877	85,000.00	Total	5,827,349.72

CONTRACTS IN FORCE.

FOR STONE SUPERSTRUCTURE, SEA SLOPE, AND RIPRAP, SOUTH HARBOR SECTION OF BUFFALO BREAKWATER, DATED JULY 25, 1905.

Name of contractor: C. M. Handy, Cleveland, Ohio.
Rates:

Tearing out old superstructure, per linear foot	$16.75
Capping stone in place, per ton	3.10
Rubblestone in place, per ton	1.30
Large riprap stone in place, per ton	1.88

Date of approval: August 4, 1905.
Date of commencement: September 5, 1905.
Date of completion: December 31, 1906. Time limit waived.
Total amount of contract: $93,160.

FOR CONSTRUCTION OF STONE BREAKWATER, SOUTH CHANNEL ARM, AT BUFFALO, N. Y., DATED MAY 31, 1906.

Name of contractor: Canal Quarry Company, Buffalo, N. Y.
Rates:

Rubblestone in place, per ton	$1.28
Capping stone in place, per ton	2.96

Date of approval: June 14, 1906.
Date of commencement: July 16, 1906.
Date of completion: December 31, 1908.
Total amount of contract: $130,000.

FOR STONE-CONCRETE SUPERSTRUCTURE ON BREAKWATER AT BUFFALO, N. Y., DATED MAY 31, 1907.

Name of contractor: Great Lakes Construction Company, Buffalo, N. Y.
Rates:

Tearing out old superstructure, per linear foot	$5.00
Capping stone in place, per ton	2.99
Rubblestone in place, per ton	1.25
Concrete in place, per cubic yard	8.00

Date of approval: June 10, 1907.
Date of commencement: June 15, 1907.
Date of completion: December 31, 1909.
Total amount of contract, $259,148.80.

FOR EXCAVATION AT SOUTH END OF BUFFALO HARBOR, NEW YORK, DATED JUNE 12, 1907.

Name of contractor: Buffalo Dredging Company, Buffalo, N. Y.
Rate: Excavaion, per cubic yard, scow measure $0.14
Date of approval: June 29, 1907.
Date of commencement: July 10, 1907.
Date of completion: December 31, 1907.
Total amount of contract: $14,000.

FOR REMOVING SHOALS OUTSIDE NORTH ENTRANCE TO BUFFALO HARBOR, DATED JUNE 14, 1907.

Name of contractor: Lake Erie Drdeging Company, Buffalo, N. Y.
Rate: Excavation, per cubic yard, scow measure $1.74
Date of approval: June 28, 1907.
Date of commencement: June 17, 1907.
Date of completion: December 31, 1907.
Total amount of contract: $55,000.

COMMERCIAL STATISTICS.

[Compiled from records furnished by collector of customs and from annual report of the Chamber of Commerce of Buffalo, N. Y.]

Arrivals and departures of vessels for the year ending December 31, 1906.

Vessels.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
Steam	2,961	6,197,026	265	264,249	3,032	6,366,668	269	213,890
Sail and barges	148	106,129	719	298,580	162	123,433	738	306,784
Total	3,109	6,303,155	984	562,829	3,194	6,490,101	1,007	520,674

Total arrivals and departures:	
Number	8,294
Tonnage	13,876,759
Increase in tonnage 1906 over 1905	1,786,606
Amount of revenue collected, year 1906:	
Lake commerce	$308,481.13
Rail commerce	447,439.95
Total	755,921.08
Value of imports:	
By lake	$1,880,101.00
By rail	4,706,571.00
Total	6,586,672.00
Value of exports:	
By lake	$2,429,826.00
By rail	28,948,056.00
Total	31,377,882.00
Enrolled tonnage, port of Buffalo ... gross tons	172,311
Greatest draft of vessels ... feet	19.5

New lines of transportation established: Yale Transit Company and Frontier Transportation Company.

Receipts by lake, for the year 1906.

[Tons of 2,000 pounds.]

Article.	Quantity.	Article.	Quantity.
Barley	328,628	Oatmeal	5,235
Broom corn	438	Oil	8
Canned goods	3,588	Oil cake	22,057
Corn	716,666	Peas	4,181
Corn meal	315	Pelts	37
Copper	78,875	Pork	8
Feed	144,937	Posts	2,546
Fish	1,596	Rags	2,679
Flaxseed	434,911	Rye	34,268
Flour	1,027,531	Seeds	8,704
Glucose	52,572	Shingles	42,241
Iron ore	5,223,356	Soap	60
Iron, pig	51,418	Spelter	759
Lard	599	Starch	186
Lath	1,278	Tallow	2,486
Lead, pig	103	Ties	7,575
Lumber	323,500	Wheat	1,656,834
Malt	223	Wool	8,669
Merchandise	111,384		
Nails	142	Total	10,680,196
Oats	379,603		

Shipments by lake for the year 1906.

[Tons of 2,000 pounds.]

Coal	2,681,808
Cement	766,095
Railroad iron	119,508
Salt	53,608
Sugar	434,225
Unclassified (merchandise)[a]	832,988
Total	4,888,142

The following statistics of the canal commerce of Buffalo for the year 1906 are compiled from the report of the local collector, Erie Canal:

Canal clearances	2,833
Freight received, Buffalo ..... tons	747,975
Freight shipped, Buffalo ..... do	1,021,744
Steamers and canal boats navigating from Buffalo on canal, about	500
Average freight rate, Buffalo to New York, for wheat, per bushel, cents	4.25

Assuming that the number of arrivals of canal boats equaled the number of clearances, the grand total of the commerce of Buffalo by lake and canal for the calendar year 1906 is as follows:

	Arrivals and departures.	Receipts of freight.	Shipments of freight.
		Tons.	*Tons.*
Lake	8,294	10,680,196	4,888,142
Canal	5,666	747,975	1,021,744
Total	13,960	11,428,171	5,909,886

Total receipts and shipments, 17,338,057 tons.

R R 4.

IMPROVEMENT OF LAKE ERIE ENTRANCE TO BLACK ROCK HARBOR AND ERIE BASIN, NEW YORK.

REPORT OF OPERATIONS.

Two dredges worked until September 18 and one dredge to November 27, when it was withdrawn for the season.

From 2 to 4 drill boats were engaged in breaking up the rock.

Work was resumed May 2, 1907, with 2 dredges; one was withdrawn June 6, and the other June 15, and at the close of the fiscal year neither had been returned to the work.

During the year 174,947 cubic yards, place measure, was removed from the basin section and 1,700 cubic yards, place measure, from the channel section.

Under the terms of this contract it should have been completed December 31, 1906, but the time limit has been waived for a reasonable period.

[a] From Monthly Summary of Commerce and Finance, 1906, Bureau of Statistics, Department of Commerce and Labor.

A survey of the excavation completed in 1906 was made February, 1907, and showed an excavation more than that previously estimated for in monthly payments amounting to $9,455.76. This amount has been paid to the contractors under paragraph 80 of the specifications.

At the close of the fiscal year the channel section is 85 per cent completed, and dredging of the basin section is about 75 per cent completed.

PROPOSED OPERATIONS AND REMARKS.

The work of excavation will be continued under the contract. All the funds authorized for this work have been appropriated.

Money statement.

July 1, 1906, balance unexpended	$551,092.65
June 30, 1907, amount expended during fiscal year, for works of improvement	325,425.66
July 1, 1907, balance unexpended	225,666.99
July 1, 1907, amount covered by uncompleted contracts	225,204.07

APPROPRIATIONS.

June 13, 1902	$200,000
March 3, 1903	200,000
April 28, 1904	125,000
March 3, 1905	52,000
June 30, 1906	237,643
Total	814,643

CONTRACT IN FORCE.

CONTRACT FOR EXCAVATION IN LAKE ERIE ENTRANCE TO BLACK ROCK HARBOR AND ERIE BASIN, NEW YORK, DATED FEBRUARY 16, 1903.

Name of contractor: Buffalo Dredging Company.

Rates:

Excavation of channel, per cubic yard, place measurement	$0.66
Excavation of basin, per cubic yard, place measurement	1.84
Placing rock with derrick, per ton	1.25

Date of approval: March 3, 1903.

Date of commencement: April 29, 1903.

Date of expiration: December 31, 1906.

Time limit waived.

COMMERCIAL STATISTICS.

For the commercial statistics relating to this work reference is made to the statistics of Buffalo Harbor. There are no means of separating the statistics relating to the portion of the harbor covered by this improvement from the general statistics of the harbor.

R R 5.

IMPROVEMENT OF BUFFALO ENTRANCE TO ERIE BASIN AND BLACK ROCK HARBOR, NEW YORK (NORTH BREAKWATER).

A full description of the locality and a discussion of the project for the work is printed, with map, in House Document No. 72, Fifty-fifth Congress, first session, and in Report of the Chief of Engineers for 1897, page 3245 et seq., and a history of the work and its completion in the Report of the Chief of Engineers for 1901, page 3324 et seq.

There were no operations during the past fiscal year, and the entire breakwater is in good condition.

REMARKS.

This breakwater is the most northerly section of the breakwater system protecting Buffalo Harbor.

It is recommended that the funds now available be reappropriated for improving harbor at Buffalo, N. Y., and that the completed breakwater be hereafter maintained from the latter appropriation and dropped as a separate work.

Money statement.

July 1, 1906, balance unexpended	$3,264.44
July 1, 1907, balance unexpended	3,264.44

APPROPRIATIONS.

March 3, 1899	$50,000.00
June 6, 1900	191,701.25
Total	241,701.25

COMMERCIAL STATISTICS.

For the commercial statistics relating to this work reference is made to the statistics of Buffalo Harbor. There are no means of separating the statistics relating to the portion of the harbor covered by this improvement from the general statistics of the harbor.

R R 6.

IMPROVEMENT OF BLACK ROCK HARBOR AND CHANNEL, NEW YORK.

REPORT OF OPERATIONS.

The first appropriation for this work was made March 3, 1905, and a contract was made with the Empire Engineering Corporation of New York February 1, 1906, for the excavation of the first 6,400 feet, more or less, of the channel.

Under the terms of this contract the work should have been commenced on or before April 8, 1906, but was not commenced until November, 1906.

At the close of the fiscal year little progress had been made, the constant breaking down of the rock cutters with which the rock is to be broken up delaying the work. No part of channel completed.

The principal cause of the trouble is the inability of the steel cutting points, which are driven onto the rock with a weight of 22 tons, to stand the strain. Different kinds of steel have been used in making the points, but none has proved satisfactory.

At a uniform rate of progress the contractor should have earned $304,792.67. The actual earnings were $16,465.02.

Proposals for further channel excavation have been invited, to be opened July 2, 1907.

Authority was given by the Chief of Engineers April 22, 1907, to build the lock 650 feet long and 70 feet wide, instead of 600 feet long and 60 feet wide as provided in the original project.

Plans and specifications for the cofferdam and lock walls were forwarded for approval May 18, 1907.

The filling with stone of a gap 300 feet long in Bird Island Pier, made by storm of October 27, 1906, was commenced December, 1906, with stone on hand, but the lateness of the season prevented effective work. It is expected to complete it during the season of 1907, with stone to be excavated from Black Rock Harbor, under the contract with the Empire Engineering Corporation.

PROPOSED OPERATIONS AND REMARKS.

Work under contract with the Empire Engineering Corporation will be continued; contract will be made and work started on another section of channel excavation. It is also expected to commence operations on cofferdam and lock walls, and to complete repairs to Bird Island Pier.

Sufficient funds for these purposes are on hand, and no estimate is made for the fiscal year ending June 30, 1909.

Money statement.

July 1, 1907, balance unexpended	$332,408.17
Amount appropriated by sundry civil act approved March 4, 1907	367,000.00
Amount appropriated by river and harbor act approved March 2, 1907	1,000,000.00
	1,699,408.17
June 30, 1907, amount expended during fiscal year, for works of improvement	14,588.20
July 1, 1907, balance unexpended	1,684,819.97
July 1, 1907, amount covered by uncompleted contracts	2,800,000.00

APPROPRIATIONS.

March 3, 1905	$100,000
June 30, 1906	233,000
March 2, 1907	1,367,000
Total	1,700,000

CONTRACT IN FORCE.

FOR EXCAVATION IN BLACK ROCK HARBOR, NEW YORK, OF CHANNEL 200 TO 240 FEET WIDE AND 23 FEET DEEP, FOR LENGTH OF 6,400 FEET, MORE OR LESS, DATED FEBRUARY 1, 1906.

Name of contractor: Empire Engineering Corporation, New York.

Rates:

Removing material overlaying bed rock, per cubic yard, place measure	$0.33
Removing bed rock, per cubic yard, place measure	1.85
Removing partition wall, per linear foot	9.00
Handling rock with derrick, per ton	.90

Date of approval: March 6, 1906.
Date of commencement: November 5, 1906.
Date of expiration: December 31, 1908.

COMMERCIAL STATISTICS.

For commercial statistics see report on Buffalo Harbor and on Tonawanda Harbor and Niagara River, New York.

R R 7.

IMPROVEMENT OF TONAWANDA HARBOR AND NIAGARA RIVER, NEW YORK.

REPORT OF OPERATIONS.

An appropriation of $3,000 was made by the river and harbor act of March 2, 1907, for removing the wrecked steamer *Embury* from the Niagara River near the Grand Island shore, about 1½ miles above Tonawanda.

Contract was made with William Anderson, of Buffalo, N. Y., May 13, 1907, for its removal. At the close of the fiscal year the work had been nearly completed.

No other work was done during the year.

PROPOSED OPERATIONS AND REMARKS.

No work is proposed for the next fiscal year.

The project is completed, except at the Buffalo waterworks intake pier, where the width of the channel is about 100 feet, and from the Tonawanda Iron and Steel Company's docks to the north line of North Tonawanda, where the depth is from 12 to 15 feet.

Further work at these points is not urgent, and sufficient funds are on hand for emergencies.

Money statement.

July 1, 1906, balance unexpended	$30,262.58
Amount apropriated by river and harbor act approved March 2, 1907	3,000.00
	33,262.58
June 30, 1907, amount expended during fiscal year, for works of improvement	318.58
July 1, 1907, balance unexpended	32,944.00
July 1, 1907, amount covered by uncompleted contracts	2,655.00
Amount (estimated) required for completion of existing project	497,287.93

APPROPRIATIONS.

August 11, 1888	$100,000	March 3, 1899	$75,000
September 19, 1890	75,000	June 13, 1902	257,700
July 13, 1902	75,000	March 2, 1907	3,000
August 18, 1894	50,000		
June 3, 1896	50,000	Total	685,700

CONTRACT IN FORCE.

FOR REMOVING WRECK OF STEAMER EMBURY FROM NIAGARA RIVER, NEW YORK, DATED MAY 13, 1907.

Name of contractor: William Anderson, Buffalo, N. Y.
Rate: For complete removal, $2,655.
Date of commencement: May 16, 1907.
Date of expiration: July 2, 1907.

COMMERCIAL STATISTICS.

[Furnished by the collectors of customs, Buffalo Creek and Niagara districts.]

Arrivals and departures of vessels for the year ending December 31, 1906.

District and vessels.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Buffalo Creek:								
Steam	55	30,024	15	2,900	60	37,193	12	1,466
Sail and barges	71	38,174	22	8,155	73	39,273	13	3,506
Niagara:								
Steam	366	265,818	50	24,376	385	275,316	35	15,592
Sail and barges	247	155,131	64	30,140	288	170,030	46	20,672
Total	739	489,147	151	65,571	806	521,812	106	41,236

Total arrivals and departures:	
Number	1,802
Tonnage	1,117,766
Decrease in tonnage, 1906 under 1905 tons	35,570
Amount of revenue collected, year 1906, on lake commerce	$151,457.10
Value of imports by lake, year 1906	$1,407,853.19
Value of exports by lake, year 1906	None.
Enrolled gross tonnage, Niagara district, 1906	31,812
Greatest draft of vessels feet	15.5

Receipts by lake and river for the year 1906.

[Tons of 2,000 pounds.]

Emery products	260
Pulp wood	480
Iron ore	265,820
Lath	1,171
Lumber	776,332
Pig iron	12,000
Posts, cedar	7,077
Railroad ties	225
Shingles	465
Total	1,064,030

Shipments by lake and river	None.
Shipments by Erie Canal [a] ... tons	277,952
Lumber shipments by Erie Canal (included in above) ... feet B. M.	140,362,442

Number of vessels passing International Bridge, Niagara River, 1906.

[Furnished by R. J. McMurray, captain of the tug *International*.]

Steamers	3,976
Other vessels	1,442
Total	5,418

Season of navigation, April 1, 1906, to December 31, 1906 ... days	275
Number of times bridge draw was opened during season	3,040
Average number of times bridge draw was opened per day	11.05

[a] Furnished by Erie Canal collector at Tonawanda, N. Y.

APPENDIX S S.

IMPROVEMENT OF HARBORS ON LAKE ONTARIO AND OF ST. LAWRENCE RIVER AND HARBORS THEREON, NEW YORK.

REPORT OF COL. H. M. ADAMS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Harbor at Charlotte, New York.
2. Harbor at Pultneyville, New York.
3. Harbor at Great Sodus Bay, New York.
4. Harbor at Little Sodus Bay, New York.
5. Harbor at Oswego, New York.
6. Harbor at Cape Vincent, New York.
7. Harbor at Ogdensburg, New York.
8. Removing sunken vessels or craft obstructing or endangering navigation.

(For letter of transmittal see Appendix R R.)

S S 1.

IMPROVEMENT OF HARBOR AT CHARLOTTE, NEW YORK.

REPORT OF OPERATIONS.

At the beginning of the fiscal year the work of reconstructing 865 feet of the west pier and 363 feet of the east pier and replacing the timber superstructure with concrete was under way with hired labor; the work being done in the manner described on page 1942, Report of the Chief of Engineers for 1906.

At the close of July, 1906, three new cribs in the west pier had been covered with concrete blocks.

At the close of August, 1906, all the cribs were sunk and 60 per cent of the season's work finished.

At the close of October, 1906, work on the west pier was completed; storm of October 29 carried away about 90 cubic yards stone filling and displaced 10 concrete blocks on east pier.

Work on piers was suspended for the season December 8, after rebuilding 583 linear feet at a cost of $32,107.57, or $55.07 per linear foot.

This completed the work of rebuilding piers provided for in the river and harbor act of March 3, 1905.

The act of March 2, 1907, appropriated $88,500 for rebuilding piers and maintenance of channel at Charlotte. A project for rebuilding 1,300 feet of the east pier was submitted, and approved March 26, 1907.

Under this project materials were purchased, and the work started April 1, 1907, and was in progress at the close of the fiscal year.

A small shoal, 800 feet out from the outer end of the east pier, was removed to a depth of 16 feet at low water during September, 1906, by the U. S. dredge *Frontenac*.

This dredge began the work of redredging the channel to a depth of 16½ feet at low water, June 15, 1907.

PROPOSED OPERATIONS AND REMARKS.

Charlotte is the lake port of Rochester and has a large commerce in coal, brought by rail from Pennsylvania mines and shipped down the St. Lawrence River and to Canadian ports on Lake Ontario.

Its commerce is large and growing, and the maintenance of its harbor to the full extent of the project is advisable.

The channel maintained between the piers and to deep water in the lake is 3,800 feet long, and requires redredging annually on account of filling, caused by deposit during high water in the Genesee River of material in suspension, and also because of sand drifting into the channel from the lake.

The crib substructure underlying about 2,900 feet of the piers was built in 1829–1834, and is of such poor construction that the crib wall timbers are gradually being washed out to the depth of about 10 feet below water, placing the piers in a dangerous condition.

The timber superstructure of the piers is also becoming exceedingly rotten.

It is proposed during the seasons of 1907 and 1908 to complete rebuilding 1,300 feet of the east pier, for which funds are on hand, and no estimate for the fiscal year ending June 30, 1909, is made in this report.

Money statement.

July 1, 1906, balance unexpended	$33,002.35
Amount appropriated by river and harbor act approved March 2, 1907	88,500.00
	121,502.35
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	37,082.25
July 1, 1907, balance unexpended	84,420.10

APPROPRIATIONS.

May 23, 1828	$300.00	June 18, 1878	$1,000.00
March 2, 1829	10,000.00	March 3, 1879	1,000.00
March 3, 1829	13,335.00	June 14, 1880	5,000.00
March 2, 1831	16,670.00	March 3, 1881	2,500.00
February 24, 1832	16,000.00	August 2, 1882	35,000.00
March 2, 1833	15,000.00	July 5, 1884	20,000.00
June 28, 1834	20,000.00	August 5, 1886	26,250.00
March 3, 1835	2,390.00	August 10, 1888	45,000.00
July 2, 1836	20,000.00	September 19, 1890	25,000.00
March 3, 1837	10,000.00	July 13, 1892	25,000.00
July 7, 1838	25,000.00	August 18, 1894	15,000.00
June 11, 1844	10,000.00	June 3, 1896	12,000.00
August 20, 1852	20,000.00	March 3, 1899	7,000.00
March 3, 1853	176.10	June 6, 1900	3,500.00
June 28, 1864	25,000.00	June 13, 1902	30,000.00
June 23, 1866	75,607.30	April 28, 1904	[a] 23,000.00
July 25, 1868	1,100.00	March 3, 1905	80,000.00
April 10, 1869 (allotment)	1,000.00	March 2, 1907	88,500.00
July 11, 1870	12,000.00		
March 3, 1871	10,000.00	Total	753,328.40
March 3, 1875	5,000.00		

[a] Returned to Treasury, $1,269.07.

COMMERCIAL STATISTICS.

Arrivals and departures of vessels for the year ending December 31, 1906.

Vessels.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Steam	167	118,386	561	593,847	167	119,475	566	597,882
Sail and barges	24	10,250	109	39,558	17	5,345	105	38,839
Total	191	128,636	670	633,405	184	124,820	671	636,721

Total arrivals and departures (tonnage, 1,523,582)	1,716
Decrease of toonnage 1906 under 1905	126,868
Amount of revenue collected year ending December 31, 1906	$2,082.99
Value of imports year ending December 31, 1906	$67,252.00
Value of exports year ending December 31, 1906	$1,107,585.00
Greatest draft of vessels feet	16¾
Enrolled tonnage, port of Charlotte net tons	1,022

Receipts by lake.

[Net tons.]

Articles.	1902.	1903.	1904.	1905.	1906.
Poles and railroad ties	3,451	406	449	.....	.....
Lumber	546	707	167	81	525
Posts, logs, and pulp wood	4,868	5,215	4,318	3,684	3,128
Lath	209	181	46	61	199
Shingles	238	75	21	.....	59
Merchandise	27	1,774	52	157	9
Feldspar	.....	.....	4,907	6,759	11,847
Total	9,339	8,358	9,960	10,742	15,762

Shipments by lake.

[Net tons.]

Articles.	1902.	1903.	1904.	1905.	1906.
Coal	547,850	560,081	543,851	586,807	416,834
Oils and merchandise	501	730	401	447	113
Total[a]	548,351	560,811	544,252	587,254	416,947

[a] Shipments of miscellaneous merchandise consisting of photo material, hardware, etc., to the value of $44,240 were made.

S S 2.

IMPROVEMENT OF HARBOR AT PULTNEYVILLE, NEW YORK.

REPORT OF OPERATIONS.

No work has been done at this harbor since 1900. The channel has filled so that the depth is from 3 to 4 feet at low water, and the piers are in poor condition.

An appropriation of $6,000 was made by the river and harbor act of March 2, 1907, for work at this harbor, and project for general repairs to piers, filling space between inner end of east pier and shore with stone, and removing about 7,500 cubic yards sand, etc., from channel was aproved March 18, 1907.

Under this project timber for repairs was purchased, and at the close of the fiscal year the work had been commenced.

PROPOSED OPERATIONS AND REMARKS.

It not being considered safe or economical to attempt the dredging with the U. S. dredge *Frontenac*, it has been arranged to remove the material to a depth of 8 feet at low water by means of a sand pump and discharge pipe to deposit the material behind the west pier. This work will be commenced early in the next fiscal year.

No estimate of funds for the fiscal year ending June 30, 1909, is made in this report.

The commerce of Pultneyville Harbor is insignificant.

Money statement.

Amount appropriated by river and harbor act approved March 2, 1907	$6,000.00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	11.84
July 1, 1907, balance unexpended	5,988.16

APPROPRIATIONS.

July 11, 1870	$5,000.00	March 3, 1881	$2,000.00
March 3, 1871	5,000.00	August 2, 1882	4,000.00
June 10, 1872	10,000.00	September 19, 1890	2,000.00
March 3, 1873	10,000.00	July 13, 1892	1,000.00
June 23, 1874	10,000.00	August 17, 1894	1,500.00
March 3, 1875	10,000.00	June 3, 1896	1,500.00
August 14, 1876	3,000.00	March 3, 1899	2,000.00
June 18, 1878	5,000.00	March 2, 1907	6,000.00
March 3, 1879	4,000.00		
June 14, 1880	3,000.00	Total	85,000.00

COMMERCIAL STATISTICS.

Arrivals and departures of vessels for the year ending December 31, 1906.

Vessel.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Sail			2	94			2	94

Total arrivals and departures (tonnage, 188)	4
Amount of revenue collected for year 1906	$46.70
Value of imports, year ending December 31, 1906	$467.00
Receipts by lake: Cedar posts ... tons	130
Enrolled tonnage, port of Pultneyville	None.
Greatest draft of vessels ... feet	6

S S 3.

IMPROVEMENT OF HARBOR AT GREAT SODUS BAY, NEW YORK.

REPORT OF OPERATIONS.

Work of partially restoring the channel to its project depth of 15 feet under emergency allotment of April 16, 1906, was begun with the U. S. dredge *Frontenac* September 16 and completed October 25, 1906, the entrance channel having been dredged 150 feet wide and 14½ feet deep at low water—from deep water in Lake Ontario to deep water in the bay.

Total material removed, 7,380 cubic yards scow measure, at a cost of $1,600, or 21⅝ cents per cubic yard.

PROPOSED OPERATIONS AND REMARKS.

The channel to be maintained is 1,800 feet long and 150 feet wide from the bay to the 15-foot curve in Lake Ontario, and requires more or less dredging annually on account of shoaling, caused by sand drifting in from the lake. There are 2,150 feet of breakwater and 2,874 feet of piers to be maintained. These are old timber crib structures in an advanced stage of decay, and require constant and extensive repairs to maintain them. They should all be rebuilt with concrete superstructure in the near future.

The river and harbor act of March 2, 1907, appropriated $50,000 for work at this harbor, and project for rebuilding with concrete superstructure about 584 feet of the west pier and 854 feet of the east pier, at an estimated cost of $42,500, was approved March 25, 1907.

It is expected to begin this work during the next fiscal year with funds on hand, and no estimate for the fiscal year ending June 30, 1909, is made in this report.

The commerce of Great Sodus Bay is not large, consisting mostly of the shipment of coal brought from Pennsylvania mines by rail.

Money statement.

July 1, 1906, balance unexpended		$1,656.01
Amount appropriated by river and harbor act approved March 2, 1907		50,000.00
		51,656.01
June 30, 1907, amount expended during fiscal year:		
For maintenance of improvement	$1,611.89	
Returned to Treasury	12.00	
		1,623.89
July 1, 1907, balance unexpended		50,032.12

APPROPRIATIONS.

March 2, 1829	$12,500.00	March 3, 1879	$2,000.00
March 3, 1829	15,280.00	June 14, 1880	3,000.00
March 2, 1831	17,450.00	March 3, 1881	5,000.00
February 24, 1832	17,000.00	August 2, 1882	25,000.00
March 2, 1833	15,000.00	July 5, 1884	10,000.00
June 28, 1834	15,000.00	August 5, 1886	16,875.00
March 3, 1835	11,790.00	August 10, 1888	24,000.00
July 2, 1836	12,600.00	September 19, 1890	10,000.00
March 3, 1837	12,000.00	July 13, 1892	15,000.00
July 7, 1838	10,000.00	August 18, 1894	15,000.00
June 11, 1844	5,000.00	June 3, 1896	8,000.00
August 20, 1852	10,000.00	March 3, 1899	14,000.00
June 23, 1866	53,151.80	July, 1899 (repayment)	1.00
March 2, 1867	80,000.00	June 13, 1902	5,000.00
July 11, 1870	5,000.00	June 13, 1902 (allotment)	1,250.00
June 10, 1872	15,000.00	March 3, 1905 (allotment)	1,588.00
June 23, 1875	15,000.00	March 2, 1907	50,000.00
March 3, 1875	10,000.00		
August 14, 1876	5,000.00	Total	547,485.80
June 18, 1878	5,000.00		

COMMERCIAL STATISTICS.

Vessels.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Steam	14	1,111	84	13,308	10	699	98	15,680
Sail and barges	22	2,969	78	13,828	9	1,621	95	15,264
Total	36	4,080	162	27,136	19	2,320	193	30,944

Total arrivals and departures (tonnage, 64,480)	410
Increase of tonnage, 1906 over 1905	14,889
Amount of revenue collected year ending December 31, 1906	$1.25
Value of imports, year ending December 31, 1906	$16,125.00
Value of imports, year ending December 31, 1906	$149,955.00
Greatest draft of vessels ... feet	14
Enrolled tonnage	None.

Receipts and shipments by lake.

[Net tons.]

Articles.	Receipts.			Shipments.		
	1904.	1905.	1906.	1904.	1905.	1906.
Coal				28,569	42,697	53,740
Merchandise	8			7	7	
Feldspar	2,213	3,507	5,154			
Miscellaneous		40				11
Total	2,221	3,547	5,154	28,576	42,704	53,751

S S 4.

IMPROVEMENT OF HARBOR AT LITTLE SODUS BAY, NEW YORK.

REPORT OF OPERATIONS.

At the beginning of the fiscal year 635 feet of old timber superstructure at inner end of east pier had been replaced with concrete and the channel restored to its full depth of 15 feet at low water.

An appropriation of $75,000 was made by the river and harbor act of March 2, 1907, for work at this harbor, and project for replacing with concrete all the timber superstructure on the west pier, 1,747 feet, and 461 feet of the east pier, at an estimated cost of $70,000, was approved March 25, 1907.

Materials were purchased, and at the close of the fiscal year the work had been started.

PROPOSED OPERATIONS AND REMARKS.

The entrance channel is 2,300 feet in length from the bay to the 15-foot curve in the lake. It requires more or less dredging annually, on account of shoaling, caused chiefly by the drifting of sand from the west.

Besides the maintenance of this channel, there are 5,237 feet of piers and breakwaters to be maintained, viz: The west pier, 1,747 feet; the east pier, 1,810 feet, and the east breakwater, 1,680 feet. The west breakwater is entirely covered by accretions of sand.

It is proposed during the next fiscal year to continue the replacing of timber superstructure with concrete, by hired labor, with funds on hand.

No estimate of funds for the fiscal year ending June 30, 1909, is made in this report.

The commerce of this port consists chiefly of shipments of coal brought by rail from Pennsylvania mines and destined to Canadian ports on Lake Ontario and the St. Lawrence River.

Money statement.

July 1, 1906, balance unexpended	$1,688.05
Amount appropriated by river and harbor act approved March 2, 1907	75,000.00
Received from other sources	20.00
	76,708.05
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	2,562.86
July 1, 1907, balance unexpended	74,145.19

APPROPRIATIONS.

August 30, 1852	$10,000.00	March 3, 1881	$20,000.00
April 9, 1864	1,778.36	August 2, 1882	25,000.00
April 9, 1864	2,224.00	July 5, 1884	10,000.00
April 9, 1864	99.00	August 5, 1886	12,500.00
June 23, 1866	33,840.41	August 10, 1888	16,000.00
March 2, 1867	50,000.00	September 19, 1890	13,000.00
April 10, 1869	1,500.00	July 13, 1892	6,000.00
July 11, 1870	5,000.00	August 18, 1894	8,000.00
March 3, 1871	15,000.00	June 3, 1896	8,000.00
June 10, 1872	15,000.00	March 3, 1899	5,500.00
March 3, 1873	15,000.00	June 13, 1902	25,000.00
June 23, 1874	15,000.00	June 13, 1902 (allotment)	[a] 2,000.00
March 3, 1875	10,000.00	March 3, 1905	30,000.00
August 14, 1876	5,000.00	March 2, 1907	75,000.00
June 18, 1878	10,000.00	Repayments	21.00
March 3, 1879	5,000.00		
June 14, 1880	20,000.00	Total	470,462.77

COMMERCIAL STATISTICS.

Arrivals and departures of vessels for the year ending December 31, 1906.

Vessels.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Steam	50	8,693	35	5,141	36	4,660	76	11,868
Sail and barges	29	8,642	96	26,829	6	1,381	158	41,308
Total	79	17,335	131	31,970	42	6,041	234	53,176

Total arrivals and departures (tonnage, 108,522)	486
Decrease of tonnage, 1906 under 1905	16,991
Amount of revenue collected, year ending December 31, 1906	$67.33
Value of imports, year ending December 31, 1906	$3,414.00
Value of exports, year ending December 31, 1906	$407,142.00
Greatest draft of vessels	13.5
Enrolled tonnage	None.

Receipts and shipments by lake.

[Net tons.]

Articles.	Receipts.			Shipments.		
	1904.	1905.	1906.	1904.	1905.	1906.
Coal				135,481	105,026	102,110
Poles and railroad ties	812					
Posts and wood	950	262	279			
Fish and miscellaneous		1		15		9
Lumber and shingles			23			
Merchandise					9	
Ice			1,400			
Hay			170			
Total	1,762	263	1,872	135,496	105,035	102,119

[a] Returned to Treasury, $1,179.04.

S S 5.

IMPROVEMENT OF HARBOR AT OSWEGO, NEW YORK.

REPORT OF OPERATIONS.

At the beginning of the fiscal year work was in progress on repairs to the outer breakwater under plan "B," as printed on page 3368, Report of the Chief of Engineers for 1904.

The method employed was to remove the deck and take out the stone filling from the cribs to a depth of about 14 feet below the water, put in corner posts, draw the lake face in place, and put back the filling and deck.

The work continued to December 19, 1906, when it was suspended for the season, 620 linear feet of the breakwater, at different points where most necessary, having been repaired, and broken and decayed deck planks replaced.

The severe storm of January 20, 1907, carried away a number of deck plank from the outer breakwater and about 200 feet of the banquette deck east of the gap. On this section 200 feet of the harbor walls were carried away to 3 feet below water level and some stone filling was washed out.

The storm of February 2–3, 1907, further damaged this section by making a breach 100 feet long where it had been weakened by the previous storm. Temporary repairs were made at once, and during April and May a crib was built and sunk in place to close this breach.

During the fiscal year two new dump scows were built at a cost of $6,201.88, to replace unserviceable ones, the dredge *Frontenac* was hauled out and thoroughly repaired at a cost of $2,182.52, and a new material scow was built at a cost of $1,620.80.

The river and harbor act of March 2, 1907, authorized a change in plan for repairing the outer breakwater to that known as "Plan A," and printed on page 3368, Report of the Chief of Engineers for 1904.

This plan contemplates a stone-concrete superstructure in place of the present timber superstructure.

A project for rebuilding 1,175 linear feet under plan "A" was approved March 26, 1907, and proposals for the work were opened June 6, 1907. One proposal was received, and upon the recommendation of this office was rejected as excessive.

A modification of the project, contemplating the placing of a heavy riprap on the lake face of the breakwater and building a stone superstructure over the crib in the breach made by storm of February 2–3, 1907, during the present season, was approved June 17, 1907, and proposals for stone have been invited, to be opened July 5, 1907.

PROPOSED OPERATIONS AND REMARKS.

The river and harbor act of March 2, 1907, appropriated $100,000 and authorized contracts to the amount of $100,000 additional for repairs of outer breakwater under plan "A." It is proposed to commence the work under modified project approved June 17, 1907, early in the next fiscal year, with funds available, and no estimate for funds for the fiscal year ending June 30, 1909, is made in this report.

Total arrivals and departures (tonnage, 665,958)	2,030
Decrease of tonnage, 1906 under 1905	40,087
Amount of revenue collected year ending December 31, 1906	$85,756.67
Value of imports, year ending December 31, 1906	$1,035,771.00
Value of exports, year ending December 31, 1906	$1,964,435.00
Greatest draft of vessels feet	14.5
Enrolled tonnage, port of Oswego gross tons	68,549

Receipts by lake.

[Net tons.]

Articles.	1902.	1903.	1904.	1905.	1906.
Lumber	60,790	49,662	67,020	60,174	59,972
Poles and railroad ties	6,861	332	3,352	2,711	1,945
Posts, pulp wood, etc	26,639	37,004	43,756	47,406	55,439
Shingles	8,766	3,510	2,470	2,744	3,045
Laths	4,237	1,189	1,100	1,517	1,588
Grain	9,832	10,895	17,745	9,063	10,668
Clay and sand	.....	238	.....	.....	.....
Hay	.....	.....	.....	.....	604
Miscellaneous	897	824	671	83	14
Total	118,022	103,654	136,114	123,698	133,275

Shipments by lake.

[Net tons.]

Articles.	1902.	1903.	1904.	1905.	1906.
Coal	213,306	629,870	576,072	600,702	482,553
Merchandise	2,681	210	315	102	12
Total	215,987	630,080	576,387	600,804	482,565

S S 6.

IMPROVEMENT OF HARBOR AT CAPE VINCENT, NEW YORK.

REPORT OF OPERATIONS.

Work of extending the breakwater 200 feet downstream, under contract with John Henrick, was in progress at the beginning of the fiscal year.

The work was completed October 4, 1906, at a total cost of $29,048.69, or $145.24+ per linear foot, including office and engineering expenses.

No other work, except minor repairs to fenders, was done during the year.

A watchman was on duty during the year to regulate the mooring of vessels to the breakwater.

PROPOSED OPERATIONS AND REMARKS.

This breakwater is not designed to protect an anchorage, but for vessels to moor to and to protect vessels moored at the wharves at Cape Vincent. The project length is 1,500 feet, and 910 feet has been completed.

No estimate of funds is made in this report.

Money statement.

July 1, 1906, balance unexpended	$23,449.23
June 30, 1907, amount expended during fiscal year, for works of improvement	22,458.63
July 1, 1907, balance unexpended	990.60
Amount (estimated) required for completion of existing project	72,000.00

APPROPRIATIONS.

June 3, 1896	$25,000
March 3, 1899	25,000
June 13, 1902	48,000
March 3, 1905	30,000
Total	128,000

COMMERCIAL STATISTICS.

Arrivals and departures of vessels for the year ending December 31, 1906.

Vessels.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Steam	15	1,795	379	42,848	23	3,795	393	41,486
Sail and barges	29	2,315	132	14,740	26	1,831	124	12,719
Total	44	4,110	511	57,588	49	5,626	517	54,205

Total arrivals and departures (tonnage 121,529)	1,121
Increase of tonnage 1906 over 1905	10,161
Amount of revenue collected for year ending December 31, 1906	$26,972.56
Value of imports, year ending December 31, 1906	$284,195.00
Value of exports, year ending December 31, 1906	$151,934.00
Enrolled tonnage, port of Cape Vincent, N. Y. gross tons	8,197
Greatest draft of vessels (at breakwater 16 feet) feet	14

New lines of transportation established: Pentecost Lumber Company line, from Cape Vincent, N. Y., to Pentecost, Quebec.

Receipts by lake and river.

[Net tons.]

Articles.	1902.	1903.	1904.	1905.	1906.
Lumber	716	635	4,553	474	6,078
Poles, ties, posts, and pulp wood	195	12,138	12,324	16,242	103,610
Shingles	948	275	909	994	526
Lath	155	25	79	.....	112
Fish	580	699	611	699	569
Hay	.....	.....	.....	.....	1,322
Miscellaneous	1,581	1,894	1,607	3,066	131
Total	4,175	15,666	20,083	21,475	112,348

Shipments by lake, miscellaneous merchandise, 153 tons.

Cotton wearing apparel to the value of $3,642 and woolen wearing apparel to the value of $5,642 was also shipped.

S S 8.

IMPROVEMENT OF HARBOR AT OGDENSBURG, NEW YORK.

REPORT OF OPERATIONS.

An emergency contract was made July 17, 1906, with the Daly & Hannan Dredging Company, of Ogdensburg, for dredging to restore project depth in upper entrance channel, and the work was commenced September 12 with one dredge. A second dredge worked from October 19 to November 23, 1906. Work was suspended for the season December 10, 1906.

Under the terms of this contract it should have been completed December 31, 1906, but at that time it was but three-fourths completed, and the time limit was waived for a reasonable period, the contractor to pay the cost of inspection and superintendence.

The work was finally completed May 21, 1907, and $154.98 was deducted from amounts due the contractor for expenses due to the waiver.

The channel was restored to its project depth of 15 feet below zero of Ogdensburg gauge, except a narrow strip at the extreme outer end on the easterly side.

Forty-two thousand four hundred and nine-six cubic yards material was removed at a total cost of $9,937.39, including office and engineering expenses.

The river and harbor act of March 2, 1907, appropriated $75,000 for work at this harbor, and a project for restoring and improving existing channels with these funds was approved March 26, 1907.

Proposals for the necessary dredging were invited, to be opened July 2, 1907.

PROPOSED OPERATIONS AND REMARKS.

This harbor fills up with sand and silt, and requires frequent dredging to maintain the depth of the project.

It is proposed with funds on hand to do the work of the project approved March 26, 1907.

No estimate of funds for the fiscal year ending June 30, 1909, is made in this report.

Money statement.

July 1, 1906, balance unexpended		$10,264.14
Amount appropriated by river and harbor act approved March 2, 1907		75,000.00
		85,264.14
June 30, 1907, amount expended during fiscal year:		
For maintenance of improvement	$10,193.66	
Returned to Treasury	61.71	
		10,255.37
July 1, 1907, balance unexpended		75,008.77

APPROPRIATIONS AND ALLOTMENTS.

August 30, 1852	$3,000.00
March 2, 1867	40,000.00
July 17, 1870	15,000.00
March 3, 1871	25,000.00
June 10, 1872	10,000.00
March 3, 1873	6,000.00
June 23, 1874	6,000.00
March 3, 1875	5,000.00
December 11, 1877 (from appropriation for "Repairs on harbors on northern lakes")	5.56
September 10, 1879 (from appropriation for "Examinations, surveys, and contingencies of rivers and harbors")	300.00
July 26, 1880 (from appropriations for "Examinations, surveys, and contingencies of rivers and harbors")	50.00
August 2, 1882	$10,000.00
July 3, 1884	15,000.00
August 5, 1886	10,000.00
August 11, 1888	15,000.00
September 19, 1890	42,000.00
July 13, 1892	40,000.00
August 18, 1894	20,000.00
June 3, 1896	20,000.00
March 3, 1899	15,000.00
June 13, 1902	20,000.00
March 13, 1905	15,000.00
March 3, 1905 (allotment)	9,938.29
March 2, 1907	75,000.00
Total	417,293.85

COMMERCIAL STATISTICS.

Arrivals and departures of vessels for the year ending December 31, 1906.

Vessels.	Arrivals from—				Departures to—			
	Home ports.		Foreign ports.		Home ports.		Foreign ports.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Steam	574	317,430	697	76,243	615	341,872	567	56,329
Sail and barges	59	10,595	133	50,863	140	44,813	54	18,078
Total	633	328,025	[illegible]	127,106	755	386,685	621	74,407

Total arrivals and departures (tonnage, 916,223)	2,839
Decrease of tonnage, 1906 under 1905	79,715
Amount of revenue collected, on water transportation, year ending December 31, 1906	$321,621.33
Value of imports by water, year ending December 31, 1906	$33,334,366.00
Value of exports by water, year ending December 31, 1906	$5,607,637.00
Enrolled tonnage, port of Ogdensburg	16,713 net tons
Greatest draft of vessels	16 feet

Receipts by water.

[Net tons.]

Articles.	1905.	1906.	Articles.	1905.	1906.
Coal	284,004	193,636	Shingles	5,241	3,765
Flour	27,212	15,967	Transit merchandise	12,488	15,759
Grain	130,246	175,896	Unclassed merchandise	41,140	17,650
Hay	2,215	473	Wood pulp	6,690	2,791
Lumber	214,082	218,319	Fish	4,700	353
Lath	6,950	5,058	Hides		525
Live stock	484	263	Miscellaneous		21,218
Nickel and copper	22,136	22,143			
Raw silk	2,290	2,423	Total	723,878	696,239

Shipments by water.

[Net tons.]

Articles.	1905.	1906.	Articles.	1905.	1906.
Coal and coke	177,540	176,848	Transit merchandise[a]	12,488	12,401
Grain	17,797	13,399	Ginseng	25	18
Machinery	26,320	46,256	Chemicals	784	818
Miscellaneous	75,253	95,052	Merchandise	.....	13,889
Cheese	.....	685			
Alcohol	.....	495	Total	310,207	359,861

[a] Merchandise in transit through Canada from one port of the United States to another port of the United States.

The value of merchandise received under consular seal was $6,985,237.

S S 9.

REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

Steamer Massena in Ogdensburg Harbor, N. Y.—This steamer, 94 feet long and 18 feet beam, caught fire at a wharf at Ogdensburg in 1903, and was allowed to drift away, landing on a bar in front of the city, about 50 feet north of the channel along the wharves. She was practically destroyed by fire, part of her hull remaining.

An allotment of $500 was made June 14, 1906, for the purpose of removing this wreck, and proposals were opened July 11, 1906, for its removal.

The only proposal received, that of the Daly & Hannan Dredging Company, of Ogdensburg, N. Y., was accepted.

The work of removal was completed September 12, 1906, at a total cost of $500.

For report on removal of wreck of steamer *Embury* from Niagara River see report "Improvement of Tonawanda Harbor and Niagara River, N. Y."

APPENDIX T T.

IMPROVEMENT OF RIVERS AND HARBORS IN CALIFORNIA, SOUTH OF SAN FRANCISCO.

REPORT OF CAPT. AMOS A. FRIES, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. San Diego Harbor, California.
2. Deep-water harbor at San Pedro Bay, California.
3. Wilmington Harbor, California.
4. San Luis Obispo Harbor, California.

UNITED STATES ENGINEER OFFICE,
Los Angeles, Cal., July 5, 1907.

GENERAL: I have the honor to forward herewith annual report on works of river and harbor improvement in my charge for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

AMOS A. FRIES,
Captain, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

T T 1.

IMPROVEMENT OF SAN DIEGO HARBOR, CALIFORNIA.

The river and harbor act of March 3, 1905, appropriated $10,000 for maintenance of the entrance channels, and as the channel through the outer bar had shoaled to 24 feet depth, authority was obtained for dredging this channel. An emergency contract was entered into September 28, 1906, with the North American Dredging Company. Work began November 24, 1906, and was completed December 18, 1906; 15,625 cubic yards of material was dredged and dumped at sea at a cost of 60 cents per yard. A channel 100 feet wide and 27 feet

deep was dredged through the bar. This channel has since shoaled to 25 feet.

The river and harbor act of March 2, 1907, appropriated $20,000 for maintenance. Authority has been obtained to enter into a contract with the North American Dredging Company for dredging a channel through the outer bar to a depth of 28 feet at low water, at a cost of 51 cents per yard. It is estimated that the 37,250 yards to be excavated under this contract will make a channel 28 feet deep and approximately 225 feet wide.

Money statement.

July 1, 1906, balance unexpended	$9,797.36
Amount appropriated by river and harbor act approved March 2, 1907	20,000.00
	29,797.36
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	9,738.23
July 1, 1907, balance unexpended	20,059.13
July 1, 1907, outstanding liabilities	26.93
July 1, 1907, balance available	20,032.20
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	30,000.00

APPROPRIATIONS.

March 3, 1873	$80,000.00	June 13, 1902	$75,000.00
March 3, 1879	1,000.00	March 3, 1903	192,850.00
August 11, 1888	1,000.00	March 3, 1905	10,000.00
September 19, 1890	60,500.00	March 2, 1907	20,000.00
July 13, 1892	50,000.00	Repayment	3.26
August 18, 1894	50,000.00		
June 3, 1896	50,000.00	Total	655,353.26
March 3, 1899	65,000.00		

CONTRACT IN FORCE.

EMERGENCY CONTRACT FOR DREDGING AT ENTRANCE TO HARBOR.

Name of contractor: North American Dredging Company.

Contract entered into September 28, 1906.

Work to begin October 28, 1906; contract completed December 18, 1906.

Contract for dredging 13,625 cubic yards through outer bar at 60 cents per cubic yard.

COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

		Incoming.	Outgoing.
Vessels:			
Steam		325	327
Sailing		82	84
Total		407	411
Tonnage		319,440	327,203
Draft, greatest	feet	27¼	26¼
Lumber	do	45,525,000	2,097,000
Coal	tons	26,700	2,483
Coke	do	2,948	63
Ores	do	1,370	193
Cement	do	27,070	595
Crude oil	do	14,767	56
Live stock	head	8,293	.....
Onyx	cubic feet	5,742	.....
Merchandise, general	tons	33,115	7,550

Total amount of freight entered and cleared in 1906, 216,761 tons, an increase of 36 per cent over the preceding year.

No lines of transportation were established or abandoned during the year.

T T 2.

DEEP-WATER HARBOR AT SAN PEDRO BAY, CALIFORNIA.

The construction of the breakwater was continued during the year, under continuing contract dated June 7, 1900, with the California Construction Company, of San Francisco, Cal.

At the beginning of the fiscal year 1,967,204 tons of stone had been deposited in the substructure, which had been raised to mean lower low water, and was about completed for the length of 8,452 feet from its westerly end, and 121,265 tons had been placed in the superstructure. The amount of superstructure work done was the equivalent of 4,500 feet of completed wall.

During the fiscal year ending June 30, 1907, 2,576 tons of granite was placed in the substructure, and 48,129 tons of granite in the superstructure, making a total of 2,139,174 tons under the contract.

No work was done in extending the substructure during the year, the stone delivered in the substructure being used to bring it up to the required height, or in filling out the slopes.

During the year the superstructure was extended 2,106 feet, making the total length about 6,606 feet.

On March 4 and 5 a heavy southeast storm displaced about 2,000 feet of the contractor's trestle. This trestle rested on top of the superstructure and was held down by wire ropes. A number of stones in the outer wall of the superstructure of the uncompleted part of the breakwater were shifted and have had to be reset.

Work on the breakwater has already advanced far enough to shelter, during stormy weather, a large anchorage area and the entrance to the inner harbor.

Bulkheading and filling certain areas in the outer harbor has been in progress during the year by the Los Angeles Inter-Urban Railway Company, the Outer Harbor Dock and Wharf Company (successors to Randolph H. Miner), the Pacific Wharf and Storage Company

(successors to John T. Gaffey and others), and the San Pedro, Los Angeles and Salt Lake Railroad Company.

Money statement.

July 1, 1906, balance unexpended	$599,932.20
Amount appropriated by sundry civil act approved March 4, 1907	92,915.00
	692,847.20
June 30, 1907, amount expended during fiscal year, for works of improvement	187,058.33
July 1, 1907, balance unexpended	505,788.87
July 1, 1907, outstanding liabilities	31,437.09
July 1, 1907, balance available	474,351.78
July 1, 1907, amount covered by uncompleted contracts	415,714.12
Amount (estimated) required for completion of existing project	100,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	100,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

June 3, 1896	[a] $50,000.00	June 30, 1906	$290,000.00
July 1, 1898	400,000.00	March 4, 1907	92,915.00
March 3, 1899	200,000.00		
March 3, 1901	146,000.00	Total	2,800,000.00
June 28, 1902	311,085.00	Receipts from sales	.05
March 3, 1903	500,000.00		
April 28, 1904	350,000.00	Total	2,800,000.05
March 3, 1905	460,000.00		

CONTRACT IN FORCE.

CONTRACT FOR CONSTRUCTION OF BREAKWATER.

Name of contractor: California Construction Company.
Contract entered into June 7, 1900; approved June 27, 1900.
Work to begin August 4, 1900; contract to be completed December, 1906.
Contract extended for reasonable period.
Rates:
For substructure stone, $0.844 per ton of 2,240 pounds.
For superstructure stone, $3.10 per ton of 2,240 pounds.
For concrete, $6 per cubic yard.
Quantities (estimated):
Stone in substructure, 2,135,958 tons; stone in superstructure, 235,275 tons; total, 2,391,233 tons.
Concrete, 2,370 cubic yards.
Total consideration of contract (approximate): $2,563,046.05.

COMMERCIAL STATISTICS FOR YEAR ENDING DECEMBER 31, 1906.

For commercial statistics see report of Wilmington Harbor, California.

[a] Of the appropriation of $50,000 made by river and harbor act of June 3, 1896, for deep-water harbor at Santa Monica Bay, or San Pedro Bay, California, $35,555.76 was expended by the Board provided for by said act. For the full report of the Board, with its accompanying documents, see Senate Document No. 18, Fifty-fifth Congress, first session.

T T 3.

IMPROVEMENT OF WILMINGTON HARBOR, CALIFORNIA.

Dredging under contract.—Under a contract dated September 8, 1905, and supplemental contract dated June 28, 1906, with A. A. Polhamus, of San Diego, Cal., there was dredged at the entrance to the harbor and dumped at sea 52,315 yards of material, at 46 cents per yard. This material consisted of fine sand and a few fragmental rock. The dredging was done to a depth of 22.5 feet.

Dredging with Government dredge.—The dredge *San Pedro* was employed during the year in dredging a 400-foot channel between the foot of the wharves and Deadmans Island to a depth of 21.5 feet below mean lower low water; between the wharves up to and including a portion of the turning basin, to a depth of 25 feet; and an additional channel 817 feet long and 20 feet deep along the easterly pierhead line as far north as the upper end of the wharves. A total of 827,320 cubic yards of material was dredged from 11,741 linear feet of cut, averaging 189 feet in width and varying from 2.5 feet to 27.5 feet deep. This material was wasted as follows:

	Cubic yards.
East of the east jetty, upon concessions of Salt Lake Railroad Company	484,420
East of the east jetty, upon concessions of Pacific Wharf and Storage Company	199,100
On west side of Terminal Island, upon lands of Salt Lake Railroad Company	88,600
Behind Timms Point, upon concessions of Outer Harbor Dock and Wharf Company	43,800
Over east and west jetties near Deadmans Island	11,400
Total	827,320

The material removed consisted of sand, clay, shell, cobbles, small fragmental rock, and old junk in varying proportions. In the lower 400 feet of cut along the westerly wharves and the upper 1,200 feet along the easterly wharves the material was particularly hard, and very slow progress was made in its removal. Much sloughing occurred at different points where the underlying strata were quicksand, frequently requiring areas to be re-covered to remove fills of from 1 to 7 feet in depth after they had once been reduced to the required grade.

The following statement shows distribution of time for the dredge during the year:

	Hrs.	min.
Moving and placing plant	513	00
Actual pumping	4,568	50
Repairs and alterations	1,269	50
Cleaning suction	94	00
Advancing	645	13
Removing wreck of *Adelaide Cooper*	25	40
Time lost to permit vessels to pass	142	52
Not working, 53 Sundays and 7 holidays	1,440	00
Not working, on account of southeast storm	11	30
Not working, on account of repairs to bulkhead	49	05
Total	8,760	00

The following statement shows the cost of dredging during the year:

Routine office work, labor, and maintenance	$2,060.04
Care of plant, labor	720.00
Surveys, labor	158.74
Towage and dispatch work; labor, supplies, and hire of tow boat	1,124.96
Alterations and repairs to dredge and attendant plant; labor and material	9,309.75
Operating dredge, including superintendence, labor charges, fuel, fresh water, lubricants, and other supplies	37,221.93
Deterioration of plant and property	16,069.71
Total cost of dredging	66,665.13
Amount of material removed ... cubic yards	827,320
Cost per cubic yard	$0.08

Removal of the wreck Adelaide Cooper.—A diver and outfit were employed eight days during May in removing the old wreck of the bark *Adelaide Cooper*, which was wrecked during a storm in December, 1879, and was found buried in the sand partly west of the east project line about 800 feet north of Deadmans Island. The timbers in the bottom of the wreck were large and securely pinned and copper fastened, their tops being 10 to 14 feet below mean lower low water. Six hundred and fifty pounds of dynamite were used in blowing and cutting this wreck into pieces small enough to be removed with ordinary tackle. The whole area covered by the wreck, estimated at 3,300 square feet, was reduced to a depth of 2 to 3 feet below the required grade, at a cost of $471.42.

Miscellaneous work.—During September the dredge was beached and her sides, ends, and knuckles examined; portions of the fender rail and hull where worms were found to have entered were cut away and engraven pieces set in where required, and an additional strip of copper sheathing 14 inches wide was put on in the well, across the bows, and under the fender rail for 60 feet aft on each side. New galvanized bolts were also put through the spud casings, replacing those entirely eaten off by the action of the salt water. These repairs cost $180.25.

The principal items of repair to the machinery of the dredge consisted in cleaning boilers in July and December; rolling leaky tubes and nipples; calking leaky seams; cutting out and replacing thirty defective rivets in reenforce sheets in steam drums; overhauling main engine and relining main pump; overhauling auxiliary machinery and cutter engine; replacing broken countershafts of starboard hauling winch, cutter engine, and cutter; putting new 20-inch suction pipe, elbow, and discharge connections to main pump in hold of dredge; reriveting cutter cage and replacing three broken cutter hubs with new castings. All the above repairs, with the exception of a small amount of boiler work, was performed by the dredge crew, the machine work being done in the machine shop aboard the dredge. The repairs were made at a cost of $8,377.75.

Repairs were made to launch *Pedrito* at a cost of $90.98.

Repairs to lighters, pontons, and skiffs were made at a cost of $660.77.

The lower end of the inclined ways, which had been worm-eaten, were replaced with new timbers at a cost of $109.98.

The boat landing at Government warehouse was repaired at a cost of $18.60.

This work was under the very efficient charge of Mr. R. A. Crawford, assistant engineer.

Money statement.

July 1, 1906, balance unexpended	$140,710.82
Amount appropriated by sundry civil act approved March 4, 1907	50,000.00
Amount appropriated by river and harbor act approved March 2, 1907	113,000.00
Receipts from sales, damages to dredge, etc	88.75
	303,799.57
June 30, 1907, amount expended during fiscal year, for works of improvement	117,831.69
July 1, 1907, balance unexpended	185,967.88
July 1, 1907, outstanding liabilities	6,061.22
July 1, 1907, balance available	179,906.66

APPROPRIATIONS.

March 3, 1871	$200,000.00	July 13, 1892	$51,000.00
June 10, 1872	75,000.00	June 3, 1896	50,000.00
March 3, 1873	150,000.00	June 13, 1902	250,000.00
March 3, 1875	30,000.00	March 3, 1905	100,000.00
June 18, 1878	20,000.00	June 30, 1906	100,000.00
March 3, 1879	12,000.00	March 2, 1907	113,000.00
June 14, 1880	35,000.00	March 4, 1907	50,000.00
March 3, 1881	33,000.00		
August 2, 1882	100,000.00	Total	1,618,000.00
July 5, 1884	50,000.00	Receipts from sales and for injuries to dredge	97.25
August 5, 1886	75,000.00		
August 11, 1888	90,000.00		
September 19, 1890	34,000.00	Aggregate	1,618,097.25

CONTRACTS IN FORCE.

CONTRACT FOR DREDGING AT ENTRANCE TO HARBOR.

Name of contractor: A. A. Polhamus.
Contract entered into September 8, 1905; approved September 19, 1905.
Work to begin November 26, 1905.
Contract completed August 18, 1906.
Contract for dredging channel 400 feet wide and 22 feet deep through outer bar, at 46 cents per cubic yard.

SUPPLEMENTAL CONTRACT FOR DREDGING AT ENTRANCE TO HARBOR.

Name of contractor: A. A. Polhamus.
Contract entered into June 28, 1906; approved July 12, 1906.
Work to begin July 12, 1906.
Contract completed August 18, 1906.
Contract for dredging 52,500 cubic yards, at 46 cents per cubic yard.

CONTRACT FOR FURNISHING CRUDE OIL.

Name of contractor: Horatio T. Harper.
Contract entered into June 22, 1906; approved July 2, 1906.
Deliveries to begin July 1, 1906.
Contract completed June 30, 1907.
Twenty-one thousand barrels of oil for fuel for dredge delivered, at 50 cents per barrel.

COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

[Furnished by the collector of customs at Los Angeles, Cal.]

	Foreign commerce.		Domestic commerce.	
	Incoming.	Outgoing.	Incoming.	Outgoing.
Vessels:				
Steam	3	3	1,009	1,005
Sailing	4	4	401	402
Total	7	7	1,410	1,407
Tonnage	12,564	12,564	629,592	628,374
Draft, greatest ... feet	24	18	24	18
Lumber ... do			447,182,128	
Live stock ... tons			1,637	
Rails, steel ... do			720	
Wool ... do			42	
Coal ... do			205	100
Flour ... do			262	
Grain ... do			21,633	
General merchandise ... do	130	96	11,950	13,647
Crude oil ... barrels			235,159	29,647
Asphalt ... tons				2,897
Salt ... do				100
Cement ... barrels	77,800			

Foreign commerce, 15,785 tons; domestic commerce, 991,691 tons; total, 1,007,476 tons, a decrease of 7 per cent from the preceding year.

No lines of transportation were established or abandoned during the year.

T T 4.

IMPROVEMENT OF SAN LUIS OBISPO HARBOR, CALIFORNIA.

No work was done during the year.

Work proposed with funds appropriated and pledged by act of March 2, 1907, has been advertised and a contract will be entered into with the San Francisco Bridge Company for the delivery of 151,140 tons (of 2,000 pounds each) of stone at $1.57 per ton.

Money statement.

July 1, 1906, balance unexpended	$241.59
Amount appropriated by river and harbor act approved March 2, 1907	63,660.00
	63,901.59
June 30, 1907, amount expended during fiscal year, for works of improvement	242.42
July 1, 1907, balance unexpended	63,659.17
July 1, 1907, outstanding liabilities	30.40
July 1, 1907, balance available	63,628.77
Amount (estimated) required for completion of existing project	200,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	100,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

August 11, 1888	$25,000.00	March 3, 1905	$25,000.00
September 19, 1890	40,000.00	March 2, 1907	63,660.00
July 13, 1892	30,000.00		
August 18, 1894	40,000.00	Total	368,660.00
June 3, 1896	40,000.00	Receipts from sales	.95
March 3, 1899	55,000.00		
June 13, 1902	50,000.00	Aggregate	368,660.95

COMMERCIAL STATISTICS FOR THE YEAR ENDING DECEMBER 31, 1906.

[Furnished by the Pacific Coast Railway Company.]

		Incoming.	Outgoing.
Vessels:			
Steam		236	236
Sailing		.....	.....
Total		236	236
Tonnage		194,950	194,950
Draft, greatest	feet	26	26
Merchandise, general	tons	10,722	2,194
Coal	do	305	.....
Lumber	feet	9,303,000	.....
Grain	tons	55	15,818
Bituminous rock	do	.....	1,468
Crude oil	barrels	.....	3,188,381

Total amount of freight entered and cleared in 1906, 580,564 tons, an increase of 30 per cent over the preceding year.

The only transportation line established during the year was one 8-inch pipe line from the Santa Maria oil fields to Port Harford.

APPENDIX U U.

IMPROVEMENT OF CERTAIN RIVERS AND HARBORS IN CALIFORNIA TRIBUTARY TO AND NORTH OF SAN FRANCISCO BAY.

REPORT OF LIEUT. COL. JOHN BIDDLE, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Oakland Harbor, California.
2. San Pablo Bay, California.
3. San Joaquin River, California.
4. Stockton and Mormon channels, California.
5. Mokelumne River, California.
6. Petaluma Creek and Napa River, California.
7. Humboldt Harbor and Bay, California.
8. Removing sunken vessels or craft obstructing or endangering navigation.

UNITED STATES ENGINEER OFFICE,
San Francisco, Cal., July 4, 1907.

GENERAL: I have the honor to transmit herewith the annual report of river and harbor works under my charge for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

JOHN BIDDLE,
Lieut. Col., Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

U U 1.

IMPROVEMENT OF OAKLAND HARBOR, CALIFORNIA.

At the beginning of the year a contract with Marshall C. Harris for dredging, at 10.5 cents per cubic yard, place measurement, was still in force. The quantity of material excavated and deposited securely ashore under the contract during the year was 674,977 cubic yards, much of which was very hard. This contract contemplates excavation for a channel 300 feet wide on the bottom and 25 feet deep, extending from San Francisco Bay easterly to Fallon street, a total distance of 22,000 feet. At the close of the year the dredge had

excavated a 300-foot channel 25 feet deep from San Francisco Bay easterly to a point off Market street, covering a distance of 16,500 feet.

On the completion of this contract there will be a channel 300 feet wide and 25 feet deep from San Francisco Bay to Fallon street, in addition to the existing channel, which, east of Fallon street, is now 300 feet wide and 17 feet deep up to the west end of the tidal basin; one of 12 feet deep and 300 feet wide around the south side of this basin, and one of 8 feet depth and 300 feet width around the north side of the basin.

About 75 per cent of this contract has been completed. It should be finally completed about March 1, 1908.

Money statement.

July 1, 1906, balance unexpended	$135,993.44
Amount appropriated by river and harbor act of March 2, 1907	68,203.00
Amount appropriated by sundry civil act approved March 4, 1907	23,000.00
	227,196.44
June 30, 1907, amount expended during fiscal year, for works of improvement	69,146.06
July 1, 1907, balance unexpended	158,050.38
July 1, 1907, outstanding liabilities	4,461.61
July 1, 1907, balance available	153,588.77
July 1, 1907, amount covered by uncompleted contracts	85,385.77
Amount (estimated) required for completion of existing project	946,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	250,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

June 24, 1874	$100,000	June 3, 1896	$20,000
March 3, 1875	100,000	June 4, 1897	200,000
August 14, 1876	75,000	July 1, 1898	133,000
June 18, 1878	80,000	March 3, 1899	133,000
March 3, 1879	60,000	June 6, 1900	180,000
June 14, 1880	60,000	June 13, 1902	100,000
March 3, 1881	60,000	March 3, 1903	131,000
August 2, 1882	200,000	April 28, 1904	19,000
July 5, 1884	139,600	March 3, 1905	100,000
August 5, 1886	60,000	June 30, 1906	81,000
August 11, 1888	350,000	March 2, 1907	68,203
September 19, 1890	250,000	March 4, 1907	23,000
July 13, 1892	150,000		
August 18, 1894	100,000	Total	2,972,803

CONTRACTS IN FORCE.

Contract dated October 9, 1905, for dredging about 1,655,000 cubic yards of material from Oakland Harbor, California. Rate: 10.5 cents per cubic yard.

Name of contractor: Marshall C. Harris.

Date of commencement: October 24, 1905.

Date of completion: Work still in progress; will probably be completed about March 1, 1908.

The date of approval of this contract is unknown, owing to the loss of all records of the office by fire.

COMMERCIAL STATISTICS.

The following statements show the traffic by vessels and by ferryboats which passed through the channel way between the jetties during the calendar year 1906.

The classified freight carried by merchant vessels during the year comprised—

	Tons.
Coal, wood, coke, and oil	180,000
Hay, grain, flour, etc	121,000
Lumber	980,000
Building materials	250,000
Miscellaneous	10,182
Total by vessels	1,541,182
Freight handled by ferries for six months during the year comprises	1,437,447
Grand total	2,978,629

U U 2.

IMPROVEMENT OF SAN PABLO BAY, CALIFORNIA.

The project for the improvement of this bay was completed in February, 1906, by the dredging of a channel through the shoal of the bay 30 feet deep at low water, 300 feet wide on the bottom, and about 5 miles long; but reports of shoaling having been received from the Navy Department, a survey was made in May, 1907, which showed that shoaling had occurred to such an extent that 24 feet was the maximum depth that could be carried over the shoalest part of the channel at low water, and that over 1,000,000 cubic yards of material had been deposited.

No work of dredging was done during the fiscal year, and the funds expended were for paying the balance due the contractor for the original work of dredging the channel, the cost of the survey, and the proportionate office and engineering expenses.

Money statement.

July 1, 1906, balance unexpended	$53,569.76
June 30, 1907, amount expended during fiscal year, for works of improvement	31,899.60
July 1, 1907, balance unexpended	21,670.16
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	16,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

June 13, 1902	$100,000.00
March 3, 1903	200,000.00
June 30, 1906	53,168.41
Total	353,168.41

COMMERCIAL STATISTICS.

The commerce passing through San Pablo Bay includes all that coming through San Francisco from the Sacramento, San Joaquin, and Napa rivers and Petaluma Creek, which being all carried on stern-wheel flat-bottom river steamers and barges, is not particularly benefited by the deep channel over the shoal. However, all the commerce of Carquines Straits and Port Costa, which is mostly carried on deep-sea ships, and all vessels going to and from Mare Island Navy-Yard are benefited by the dredged channel.

U U 3.

IMPROVEMENT OF SAN JOAQUIN RIVER, CALIFORNIA.

The dredging which was being done in Stockton channel at the beginning of the fiscal year was completed by the middle of July and gave a good channel to Stockton. To complete the contract required the removal of 146,570 cubic yards of material, at a total cost of $9,820.19.

The rainy season of 1906–7 was an excessive one, and the freshets coming down Mormon Slough caused such shoaling in Stockton channel that boats could not reach Stockton. An emergency contract was made in December, 1906, with the San Francisco Bridge Company to do the dredging required to remove the shoal at 6.48 cents per cubic yard. Work was commenced on January 14, 1907, and is still in progress. The continued violent rains having caused more freshets to bring down additional débris from Mormon Slough and obliterate the channels already dug, the completion of the work under the existing contract will take longer than was at first anticipated. At the close of the fiscal year 203,621 cubic yards of material had been dug, at a cost of $6,801.77. It is expected that the contract will be completed by the middle of August.

Until the waters of Mormon channel are diverted into the Calaveras River the spring freshets will necessitate dredging each year to keep navigation open, and for this purpose it is proposed to expend the present available balance.

Money statement.

July 1, 1906, balance unexpended	$18,774.29
Amount appropriated by river and harbor act approved March 2, 1907	30,000.00
	48,774.29
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	14,563.77
July 1, 1907, balance unexpended	34,210.52
July 1, 1907, outstanding liabilities	3,735.54
July 1, 1907, balance available	30,474.98
July 1, 1907, amount covered by uncompleted contracts	5,000.00
Amount (estimated) required for completion of existing project	Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	30,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

August 14, 1876	$20,000	June 3, 1896	$57,750
June 14, 1880	20,000	March 3, 1899	20,000
March 3, 1881	40,000	June 13, 1902	18,000
August 2, 1882	40,000	Allotted from act of April 28, 1904	35,170
July 5, 1884	20,000	March 3, 1905	20,000
August 5, 1886	18,750	March 2, 1907	30,000
August 11, 1888	25,000		
September 19, 1890	75,000		
July 13, 1892	65,000	Total	554,670
August 18, 1894	50,000		

CONTRACT IN FORCE.

Emergency contract, dated December 27, 1906, for dredging in Stockton channel, California.

Name of contractor: San Francisco Bridge Company.

Rate: 6.48 cents per cubic yard.

Date of commencement: January 14, 1907.

Date of completion: Work is still in progress; will probably be completed about the middle of August, 1907.

COMMERCIAL STATISTICS.

The commerce of the San Joaquin River is large and important. Two companies run boats and barges regularly between San Francisco and Stockton, the head of navigation on the lower river, and a large number of schooners ply on the lower river, carrying the heavier freight.

The following is a statement of the commerce carried by the vessels of the steamboat lines, but it has been found impracticable to obtain an authentic statement of the freight carried by the schooners and launches which ply on the river, as they run irregularly and no account is kept of their business:

EXPORTS.

	Tons.	Value.
Flour and mill stuffs	140,623	$4,925,785
Grain	109,427	2,713,260
Merchandise	65,248	3,410,998
Tan bark	2,640	58,080
Lumber	819	65,576
Fruit and vegetables	50,823	2,032,920
Hay	1,074	19,332
Canned goods	1,803	300,500
Wool	140	42,000
Live stock	2,802	448,320
Total	375,399	14,026,771

IMPORTS.

Lumber	10,714	$692,280
Coal	170	1,360
Live stock	534	85,440
Merchandise	53,483	3,487,550
Total	64,901	4,266,630

U U 4.

IMPROVEMENT OF STOCKTON AND MORMON CHANNELS, CALIFORNIA.

A description of what is proposed for this improvement is printed in the Annual Report of the Chief of Engineers for 1906, page 2430. Work has not yet been commenced, as the title for the right of way for the canal has not yet been vested in the United States. Title has been acquired by the State of California and has been reported to have been transferred to the United States, but the United States Attorney-General has not yet approved the transfer.

Money statement.

July 1, 1906, balance unexpended	$224,316.00
July 1, 1907, balance unexpended	224,316.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 — Submitted in compliance with requirements of sundry civil act of June 4, 1897.	56,079.00

APPROPRIATIONS.

June 13, 1902	$50,000	March 3, 1905	$49,316
March 3, 1903	30,000		
April 28, 1904	25,000	Total	224,316

U U 5.

IMPROVEMENT OF MOKELUMNE RIVER, CALIFORNIA.

No work was done on this river during the last fiscal year. Snags have re-formed in the river and trees regrown on the banks. These interfere with navigation, and it is proposed to remove them with the funds available.

Money statement.

July 1, 1906, balance unexpended	$1,197.12
Amount appropriated by river and harbor act approved March 2, 1907	2,500.00
July 1, 1907, balance unexpended	3,697.12
Amount (estimated) required for completion of existing project	Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 — Submitted in compliance with requirements of sundry civil act of June 4, 1897.	2,500.00

APPROPRIATIONS.

July 5, 1884	$8,500	March 3, 1905	$2,500
August 5, 1886	2,500	March 2, 1907	2,500
August 11, 1888	2,000		
July 13, 1892	2,500	Total	23,000
August 18, 1894	2,500		

COMMERCIAL STATISTICS.

No record has been kept of the tonnage on this river. It is estimated by various parties as between 50,000 and 100,000 tons for the year 1906. This is largely carried by scow schooners on irregular trips. The steamboat company operating on the river gives the amount of tonnage carried by its steamers in 1906 as 25,000 tons, at an estimated value of $1,500,000. The imports are lumber, coal, live stock, and merchandise; the exports, grain, fruit, vegetables, and other produce.

U U 6.

IMPROVEMENT OF PETALUMA CREEK AND NAPA RIVER, CALIFORNIA.

(A) PETALUMA CREEK.

No work was done on this creek during the last fiscal year. Funds for redredging having been appropriated by the river and harbor act of March 2, 1907, the sum of $42.25 was expended on a survey of the creek to determine the amount of excavation required to obtain the depths and widths required by the approved project. At the end of the fiscal year specifications for the work were being prepared.

Money statement.

July 1, 1906, balance unexpended	$2,231.23
Amount appropriated by river and harbor act approved March 2, 1907	15,239.00
	17,470.23
June 30, 1907, amount expended during fiscal year, for works of improvement	42.25
July 1, 1907, balance unexpended	17,427.98
July 1, 1907, outstanding liabilities	250.00
July 1, 1907, balance available	17,177.98
Amount (estimated) required for completion of existing project	Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	5,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

June 14, 1880	$8,000	March 3, 1899	$4,000
March 3, 1881	8,000	June 13, 1902	3,000
August 2, 1882	14,000	March 3, 1905	2,000
August 11, 1888	2,000	March 2, 1907	15,239
September 19, 1890	4,000		
July 13, 1892	10,000	Total	85,239
August 18, 1894	15,000		

COMMERCIAL STATISTICS.

The commerce of Petaluma Creek for 1906 was carried by two steamers—the *Gold*, of 334 tons, and the *Sonoma*, of 305 tons, which made daily trips between San Francisco and Petaluma, and by 38 scow schooners, which plied on the creek at various times.

The following statistics, collected under the direction of the Chamber of Commerce of Petaluma, show the quantity of freight carried:

	Tons.	Value.
IMPORTS.		
By schooner	88,795	$1,954,625
By steamer	70,784	1,054,620
Total	159,579	3,009,245
EXPORTS.		
By schooner	11,230	148,274
By steamer	4,216	1,088,795
Total	15,446	1,237,069
Total freight	175,025	.....

Passengers carried by steamer, 75,000.

(B) NAPA RIVER.

No work has been done on this river during the fiscal year. Funds having been appropriated by the act of March 2, 1907, and reports of shoaling in the river having been made, a survey was made in June, 1907, at a cost of $55.45, to ascertain the quantity of material necessary to be removed to obtain the depths and widths required by the approved project. Specifications for dredging under an emergency contract were prepared and bids invited. Bids will be opened on July 6, 1907.

Money statement.

July 1, 1906, balance unexpended	$1,234.20
Amount appropriated by river and harbor act approved March 2, 1907	8,000.00
	9,234.20
June 30, 1907, amount expended during fiscal year, for works of improvement	55.45
July 1, 1907, balance unexpended	9,178.75
July 1, 1907, outstanding liabilities	62.50
July 1, 1907, balance available	9,116.25
Amount (estimated) required for completion of existing project	Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	3,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

August 12, 1888	$7,500.00	April 28, 1904 (allotted)	$4,429.36
September 19, 1890	10,000.00	March 3, 1905	1,000.00
August 18, 1894	4,000.00	March 2, 1907	8,000.00
June 3, 1896	4,000.00		
June 13, 1902	3,000.00	Total	41,929.36

COMMERCIAL STATISTICS.

During 1906 the commerce of Napa River was carried on three steamboats, the *St. Helena*, 344 tons; the *Zinfandel*, 320 tons, and the *Napa City*, 178 tons, which maintain a regular daily service between San Francisco and Napa; and by many scow schooners which make trips to the city of Napa at irregular periods.

The following statement of the quantity of freight carried during the year 1906 was collected and furnished by the Napa Chamber of Commerce:

	Tons.		Tons.
General merchandise	52,948	Hay, grain, and feed	29,760
Wine	18,248	Coal	2,374
Beer	671	Fuel oil	230
Lumber	11,237	Live stock	350
Lime, cement, and plaster	5,011		
Brick	3,369	Total	182,642
Gravel and sand	58,444		

Passengers carried, 6,393.

U U 7.

IMPROVEMENT OF HUMBOLDT HARBOR AND BAY, CALIFORNIA.

The history of this work is printed in the Annual Report of the Chief of Engineers for 1900, page 4237.

All work authorized for the improvement of the entrance has been completed. Preliminary examination, with a view to further improv-

ing the entrance to the bay, was authorized in the river and harbor act of March 2, 1907. Examination has been made; survey is required and has been authorized to make an estimate to determine cost of improvement.

Money statement.

July 1, 1906, balance unexpended	$9,542.70
Amount appropriated by river and harbor act approved March 2, 1907	83,000.00
	92,542.70
June 30, 1907, amount expended during fiscal year, for works of improvement	224.75
July 1, 1907, balance unexpended	92,317.95
July 1, 1907, outstanding liabilities	20.00
July 1, 1907, balance available	92,297.95
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	10,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

March 2, 1881	$40,000	June 11, 1896	$225,000
August 2, 1882	40,000	June 4, 1897	350,000
July 5, 1884	62,500	July 1, 1898	100,000
August 5, 1886	75,000	March 3, 1899	50,000
August 11, 1888	125,000	March 3, 1899	143,115
September 19, 1890	80,000	March 2, 1907	83,000
July 13, 1892	150,000		
March 3, 1893	522,000	Total	2,270,615
March 2, 1895	225,000		

COMMERCIAL STATISTICS.

The following statement of the commerce of Humboldt Bay, California, for the year 1906 was collected and supplied by Mr. George A. Kellogg, secretary of the Humboldt Chamber of Commerce, at Eureka, Cal.:

Article.	Tons.	Value.
EXPORTS.		
Lumber	592,009	$7,201,000
Produce	11,970	1,902,470
Manufactured articles	1,733	384,040
Miscellaneous	18,278	450,265
Total	623,990	9,937,775
IMPORTS.		
General merchandise	93,084	4,654,200
Railroad iron	878	30,730
Coal	4,712	28,272
Hay	1,432	18,184
Fuel oil	8,469	72,588
Miscellaneous	7,184	527,863
Total	115,759	5,330,837

Movement of vessels, tonnage, and passengers.

	Steam.	Sail.	Total.	Tonnage.	Passengers.
Arrived	904	98	1,002	475,954	18,276
Departed	899	105	1,004	476,903	17,147
Total	1,803	203	2,006	952,857	35,423

U U 8.

REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

REMOVAL OF WRECK OF WITCH OF THE BAY.

In April, 1907, a report was received that the scow schooner, *Witch of the Bay*, a small vessel of 22 tons, had been sunk in Mare Island Straits and was a menace to navigation. An examination was made, and the vessel was found to be laden with sand and to be sunk in the fairway of the channel, and to be, as reported, an obstruction to navigation. The owners abandoned the vessel, instructions were received to remove it, and an allotment of $200 was made for the purpose.

The vessel drifted and lodged against black buoy No. 1, about a quarter of a mile south of Mare Island light, where its masts and bowsprit were found held fast to the buoy by the wire rigging. The masts and bowsprit were cut loose and removed, but the hull could not be found. It is believed to have sunk and to be buried in the soft mud of the bottom in 30 feet of water, where it will not in any way interfere with navigation.

The total cost of removal of the wreck was $34.68.

APPENDIX V V.

IMPROVEMENT OF SACRAMENTO AND FEATHER RIVERS, CALIFORNIA.

REPORT OF CAPT. THOS. H. JACKSON, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

WAR DEPARTMENT,
OFFICE OF CALIFORNIA DÉBRIS COMMISSION,
San Francisco, Cal., July 3, 1907.

GENERAL: I have the honor to forward herewith the annual report of the Board of Engineer officers for the improvement of the Sacramento and Feather rivers, California, for fiscal year ending June 30, 1907. * * *

Very respectfully, your obedient servant,

THOS. H. JACKSON,
Captain, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

REPORT OF BOARD OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,
San Francisco, Cal., June 30, 1907.

GENERAL: The Board of Engineers created by the act of Congress approved June 3, 1906, " for the purpose of making surveys and examinations " of the Sacramento and Feather rivers, to " submit the most feasible plan for the improvement of said rivers and the maintenance of navigation thereon, and to have charge of the work by them recommended as appropriations are made therefor," now consists of Lieut. Col. John Biddle, Maj. C. H. McKinstry, and Capt. Thos. H. Jackson, Corps of Engineers.

The present project for improvement was printed in the Annual Report of the Chief of Engineers for 1899 (pp. 3171–3181).

For details concerning the operations during the past fiscal year attention is invited to the accompanying report of Capt. Thos. H. Jackson, Corps of Engineers, secretary and disbursing officer of the Board, who is now in immediate charge of the work.

Respectfully submitted.

JOHN BIDDLE,
Lieut. Col., Corps of Engineers.
C. H. MCKINSTRY,
Major, Corps of Engineers.
THOS. H. JACKSON,
Captain, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

REPORT OF CAPT. THOS. H. JACKSON, CORPS OF ENGINEERS.

The operations during the fiscal year ending June 30, 1907, were confined to the Sacramento River, and consisted principally of removing snags from the stream, cutting trees along the banks at points where the banks were caving so as to threaten the precipitation of the trees into the river, and the construction of wing dams to concentrate the flow at shoal places, the object being to maintain a least low-water channel depth of 7 feet in the 64 miles of the Sacramento River from its mouth to Sacramento, 4 to 5 feet in the 90 miles from Sacramento to Colusa, and 2 to 2½ feet in the 100 miles from Colusa to Redbluff, the latter point being the head of navigation on the Sacramento River. No operations were carried on the past year on the Feather River. The operations on the Sacramento River the past year were carried on by hired labor, using the U. S. snag boat *Seizer* and crew of about 35 men. The snag boat was placed in commission on July 12, 1906. It was tied up for the winter on November 15, 1906. It was again placed in commission on June 1, 1907, and on June 30, 1907, was removing snags and other obstructions from the Sacramento River in the vicinity of Jacinto. During the year the snag boat was in commission one hundred and fifty-seven days, and ran 1,205 miles. One wing dam 240 feet long was built at the foot of Jacinto chute, and another wing dam 380 feet long was built at Walshs Cut-off. During the fiscal year 1,225 snags were removed from the river, 804 trees were cut, 216 piles were driven, and 690 cubic yards of brush was placed in wing dams.

The projected least low-water channel depth of 7 feet in the Sacramento River from its mouth up to the city of Sacramento has existed the past year, also the projected least low-water depths of 4 to 5 feet from the city of Sacramento up to Colusa. The low-water depths of 2 to 2½ feet from Colusa up to Redbluff have also been maintained, but the high waters of the past spring brought many trees and snags into that section of the stream. These are now being removed.

Steamboats navigate the Sacramento River between its mouth and Colusa all the year round. Steamboat navigation between Colusa and Redbluff is limited to the high-water period of each year, commencing in December or January and ending in June or July.

The sum of $25,000 is required to be expended annually in removing snags, cutting trees, and constructing wing dams in order to maintain the projected channel depths mentioned above.

Money statements.

SACRAMENTO AND FEATHER RIVERS, CAIFORNIA.

July 1, 1906, balance unexpended	$50.88
December 18, 1906, amount received from sales	1,613.72
Amount appropriated by river and harbor act approved March 2, 1907	50,000.00
	51,664.60
June 30, 1907, amount expended during fiscal year, for works of improvement	328.74
July 1, 1907, balance unexpended	51,335.86
July 1, 1907, outstanding liabilities	3,075.51
July 1, 1907, balance available	48,260.35
Amount (estimated) required for completion of existing project	Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	25,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

SACRAMENTO RIVER, CALIFORNIA.

July 1, 1906, balance unexpended	$33,542.83
November 19, 1906, amount received from sales	16.16
	33,558.99
June 30, 1907, amount expended during fiscal year, for works of improvement	14,900.75
July 1, 1907, balance unexpended	18,658.24

APPROPRIATIONS.

SACRAMENTO AND FEATHER RIVERS, CALIFORNIA.

March 3, 1875	$15,000.00	
June 18, 1878	15,000.00	
March 3, 1879	20,000.00	
June 14, 1880	45,000.00	
March 3, 1881	60,000.00	
August 2, 1882	250,000.00	
July 5, 1884	40,000.00	
August 11, 1888	20,000.00	
September 19, 1890	30,000.00	
July 13, 1892	150,000.00	
August 18, 1894	115,000.00	
June 13, 1902	25,000.00	
April 28, 1904 (allotted)	22,000.00	
March 2, 1907	50,000.00	
Received from sales	1,727.40	
		$858,727.40

SACRAMENTO RIVER, CALIFORNIA.

March 3, 1899	$30,000.00	
June 6, 1900	60,000.00	
Received from sales	16.16	
		$90,016.16
Total		948,743.56

COMMERCIAL STATISTICS.

The commerce of the Sacramento and Feather rivers is carried principally on barges towed by steamboats and on scow schooners.

About 30 stern-wheel steamboats and many barges, launches, and scow schooners are engaged in this traffic. The commerce consists principally of grain, mill stuffs, lumber, groceries, fruit, vegetables, and general merchandise.

The reports received of tonnage carried on the rivers during the calendar year 1906 are incomplete. Sufficient data have been received, however, to indicate that the total commerce carried and towed by steamboats during that year amounted to about 375,000 tons.

It has not been practicable to ascertain the amount of commerce carried by the numerous scow schooners plying the river below the city of Sacramento, but it is known to be considerable.

APPENDIX W W.

IMPROVEMENT OF RIVERS AND HARBORS IN WESTERN OREGON, OF COLUMBIA RIVER ABOVE THE MOUTH OF WILLAMETTE RIVER, AND OF SNAKE RIVER, OREGON, WASHINGTON, AND IDAHO.

REPORT OF LIEUT. COL. S. W. ROESSLER, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Coquille River, Oregon, from Coquille to mouth.
2. Entrance to Coos Bay and Harbor, Oregon.
3. Coos River, Oregon.
4. Mouth of Siuslaw River, Oregon.
5. Yaquina Bay, Oregon.
6. Tillimook Bay and bar, Oregon.
7. Dredging plant for use at harbors on coasts of Oregon and Washington.
8. Upper Columbia and Snake rivers, Oregon and Washington.
9. Columbia River between the foot of The Dalles Rapids and the head of Celilo Falls, Oregon and Washington.
10. Canal at the Cascades, Columbia River, Oregon.
11. Operating and care of canal and locks at the Cascades of the Columbia River, Oregon.
12. Columbia River between Vancouver, Washington, and mouth of Willamette River.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., July 3, 1907.

GENERAL: I have the honor to transmit herewith annual report * * * for the fiscal year ending June 30, 1907, pertaining to "improvement of rivers and harbors in western Oregon and of Columbia River above the mouth of Willamette River, including Snake River, Oregon, Washington, and Idaho," in my charge.

Very respectfully, your obedient servant,

S. W. ROESSLER,
Lieut. Col., Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

W W 1.

IMPROVEMENT OF COQUILLE RIVER, OREGON, FROM COQUILLE CITY TO MOUTH.

Information concerning the project for the construction of jetties at the mouth of the Coquille River is given in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

The last work done on the north jetty was the completion of the contract of John Kiernan at the close of the last fiscal year. This

work resulted in extending the north jetty a distance of 225 feet seaward.

The completed south jetty and the partially completed north jetty have suffered no material injury during the past year. The enrockment at the outer ends of the jetties has been beaten down to some extent by the sea, and four of the tramway trestle bents at the sea end of the north jetty carried away.

The depth on the ocean bar has remained at about 9 feet at low tide.

No active operations have been carried on during the past year. The Government plant used in jetty construction in former years has been cared for by a watchman.

The receiving wharf and approach to the north jetty, including the land on which they are located, have been purchased from the former contractors for $1,355.

The river and harbor act of March 2, 1907, made provision for the completion of the project by extending the north jetty to its projected length. Specifications covering the work were prepared and issued, and proposals were opened on June 5, 1907, which resulted in making a contract under date of June 20, 1907, with Mr. Robert Wakefield, of Portland, Oreg. The price named in the proposal for the stone was $1.65 per ton, as against $1.20 paid under previous contract. All the stone is to be taken from Tupper Rock quarry. The raise in the price of stone is due in part to the advance cost of labor and materials, to the strict enforcement of the eight-hour law, and to the fact that the most available portion of the Tupper Rock quarry has already been used. In prosecuting this contract no mattress foundation is to be required on account of the proximity of the bed rock to the ocean bed in line of the proposed jetty extension.

Mr. J. S. Polhemus, assistant engineer, has been in local charge of the work.

Money statement.

July 1, 1906, balance unexpended		$12,979.35
Amount appropriated by river and harbor act approved March 2, 1907		60,000.00
		72,979.35
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$8,594.60	
For maintenance of improvement	1,160.74	
		9,755.34
July 1, 1907, balance unexpended		63,224.01
July 1, 1907, outstanding liabilities		60.00
July 1, 1907, balance available		63,164.01
July 1, 1907, amount covered by uncompleted contracts		51,778.00

APPROPRIATIONS.

June 14, 1880	$10,000	June 3, 1896	$20,000
August 2, 1882	10,000	March 3, 1899	40,000
July 5, 1884	10,000	June 13, 1902	30,000
August 5, 1886	20,000	March 3, 1905	55,000
August 11, 1888	25,000	March 2, 1907	60,000
September 19, 1890	30,000		
July 13, 1892	25,000	Total	355,000
August 18, 1894	20,000		

CONTRACT IN FORCE.

Formal:

Name of contractor: Robert Wakefield, Portland, Oreg.
Date of contract: June 20, 1907.
Character: Jetty work.

Approximate quantities (in place), with prices:

5,000	linear feet piles, at 20 cents	$1,000
40,000	feet B. M. lumber, at $20	800
400	pounds ship spikes, at 6 cents	24
2,500	pounds driftbolts, at 5 cents	125
12	tons old rails, relaid, at $12	144
800	pounds new railroad spikes, at 6 cents	48
1	new frog and switch	125
30,000	tons stone, at $1.65	49,500
150	pounds new bolts and nuts, at 8 cents	12

Approved: Contract authorized by telegram dated Office Chief of Engineers, June 18, 1907.

Date of beginning: Thirty working days after date of notification of approval.

Date of expiration: Eighteen months after date of notification of approval.

COMMERCIAL STATISTICS.

The following commerce was carried by vessels across the bar at the mouth of the Coquille River during the year ending December 31, 1906:

Articles.	Inbound.	Outbound.
	Tons.	*Tons.*
Broom handles	.....	159
Grain	45	234
Hay	45	.....
Lumber	.....	55,926
Match wood	.....	4,201
Miscellaneous	3,810	856
Shingles	.....	2,012
Total	3,900	63,388

Number of passengers arrived by sea, 111; departed by sea, 95; total, 206.

List of vessels crossing bar at entrance of Coquille River, Oregon, during the year ending December 31, 1906.

Name.	Net tonnage.	Depth.	Name.	Net tonnage.	Depth.
		Feet.			*Feet.*
Advance	171.0	8.5	Hugh Hogan	355.0	9.8
Albion	75.0	5.0	Lizzie Prien	91.0	6.4
Antelope	117.0	7.0	Mayflower	86.0	6.2
Bender Brothers	80.0	6.8	Oakland	383.0	9.5
Berwick	95.0	7.1	Oregon	304.0	9.9
Bessie K	93.0	7.6	Raymond	471.0	13.0
Chico	396.0	18.0	Rita Newman	120.0	8.6
Chinook	771.0	9.7	Ruby	306.0	9.0
Coquille	97.0	6.4	San Buena Ventura	171.0	8.5
Coquille River	265.0	12.4	Sotoyome	394.0	10.0
C. T. Hill	133.0	7.5	Traveller	72.0	10.7
Elizabeth	284.0	9.9	Triumph	27.3	8.0
Geo. R. Vosburg	66.0	8.7			

W W 2.

IMPROVEMENT OF ENTRANCE TO COOS BAY AND HARBOR, OREGON.

For information concerning the approved project for the improvement of Coos Bay and Harbor, Oregon, attention is invited to the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

No active operations were carried on during the past fiscal year other than the planting during March and April of about 57 acres of the north spit with Holland grass (Arunda arenaria). The grass roots for this planting were obtained from the adjacent plantations of former years.

The Government plant, which is nearly worn out, was cared for during the year by a watchman. The entire jetty tramway and wharf have been entirely destroyed by the teredo and decay. The jetty embankment has been beaten down but very slightly by the sea during the past year.

Money statement.

July 1, 1906, balance unexpended	$26,801.53
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,525.54
July 1, 1907, balance unexpended	25,275.99
July 1, 1907, outstanding liabilities	50.00
July 1, 1907, balance available	25,225.99
Amount (estimated) required for completion of existing project	1,741,412.20

APPROPRIATIONS.

March 3, 1879	$40,000.00	March 3, 1899	$150,000.00
March 3, 1881	30,000.00	June 13, 1902	50,000.00
August 2, 1882	30,000.00	Received from other sources	264.04
July 5, 1884	30,000.00		
August 5, 1886	33,750.00		
August 11, 1888	50,000.00	Total	939,014.04
September 19, 1890	125,000.00	April 5, 1905, allotted to Coos River	3,000.00
July 13, 1892	210,000.00		
August 18, 1894	95,000.00		
June 3, 1896	95,000.00	Aggregate	936,014.04

COMMERCIAL STATISTICS.

The following commerce was carried by vessels across the bar at the entrance to Coos Bay during the year ending December 31, 1906:

Articles.	Inbound.	Outbound.	Articles.	Inbound.	Outbound.
	Tons	*Tons.*		*Tons.*	*Tons.*
Chittim bark	46	1,775	Machinery	837	.....
Coal	2	40,033	Match wood	.....	270
Cord wood	.....	70	Miscellaneous	26,279	15,248
Dairy produce	28	373	Piles	.....	709
Eggs	7	.....	Railroad cars	900	.....
Fish	389	100	Railroad iron	337	.....
Fruit	453	215	Shingles	.....	229
Grain	1,320	250	Vegetables	108	619
Hay	60	45	Woolen goods	84	8
Laths	.....	139			
Live stock	3	4	Total	30,914	153,541
Lumber	111	93,454			

Number of passengers arrived by sea, 4,680; departed by sea, 4,352; total, 9,032.

List of vessels crossing the bar at entrance to Coos Bay, Oregon, during the year ending December 31, 1906.

Name.	Net tonnage.	Depth.	Name.	Net tonnage.	Depth.
		Feet.			*Feet.*
Advent	399	12.6	Compeer	308	11.2
Agate	595	18.5	Corinthian	89	6.8
Albert Meyer	398	11.9	Czarina	793	14.1
Alcatraz	193	10.8	Daring	185	10.9
Alliance	481	12.0	Dawn	9	4.5
Alpha	274	9.5	Encore	572	14.0
Amelia	338	10.8	Eric	498	12.8
Andy Mahoney	495	13.1	Esther Buhne	245	9.0
Annie Larson	326	11.0	F. A. Kilburn	458	20.0
Antelope	117	7.0	F. M. Slade	560	14.3
Arago	476	12.2	Gleaner	392	11.0
Bertie Minor	230	9.8	Glen	121	8.3
Berwick	95	7.1	Glendale	281	9.0
Beulah	339	10.9	Guide	137	7.4
Breakwater	793	19.3	Harriet G	188	10.5
Casco	539	12.6	Heather	.....	14.9
Chico	396	18.0	Homer	331	17.0
Chinook	771	9.7	Hunter	52	10.4
Churchill	600	11.6	Ida McKay	178	8.6
Columbine	212	15.0	Ida Schmaver	204	9.4
Ivy	135	8.8	Raymond	471	13.0
James A. Garfield	300	10.2	Redondo	462	11.5
Jessie Minor	219	9.2	Repeat	410	12.0
Jim Butler	.....	.....	Reta	18	4.9
L. Roscoe	75	9.0	Robarts	24	6.5
Marshfield	294	10.5	Sampson	189	15.6
M. F. Plant	941	25.0	Sausalito	326	10.0
Mildred	411	12.2	Scotia	132	9.5
North Bend	357	11.2	Sea Rover	116	15.0
Northwest	489	13.9	Sequoia	258	12.0
Novelty	584	13.0	Signal	392	13.8
Noyo	229	10.5	Sophie Christenson	570	13.4
Oakland	296	10.9	Tamalpais	422	13.0
Oceania Vance	384	11.3	Thomas L. Wand	.....	.....
Omega	522	13.5	Traveler	72	10.7
Orient	296	10.9	Triumph	27	8.0
Ottillie Fjord	247	9.6	Volunteer	542	12.0
Perry	.....	.....	Washcalore	303	10.0
Queen	204	10.0	Wawona	413	12.3
			Wizard	69	11.4

W W 3.

IMPROVEMENT OF COOS RIVER, OREGON.

The project for obtaining a channel 50 feet wide, free from obstructing bowlders and snags, from the mouth of the river in Coos Bay to the head of tide on the North and South forks, and the result of operations, are mentioned in the Annual Report of the Chief of Engineers for 1900, pages 644–645, 4283–4284.

OPERATIONS DURING THE FISCAL YEAR 1907.

At the beginning of the fiscal year the work of removing snags from Coos River was in progress by hired labor and use of Government plant and was continued until August 16, when the channel was left in good condition, all obstructing snags having been removed.

The freshets of the past winter carried additional obstructions into the channel and caused some of the bars to shoal. The Government plant was again put in order, and snagging operations were resumed on May 16 and were in progress at the end of the year.

It is proposed to continue the work until the channel has been thoroughly cleared to the head of navigation on both the North and South forks; also to remove bowlders and to dredge some of the shoalest bars. It is believed that this work will be completed by the last of September, 1907.

The expense of the work does not exceed $500 per month, and it is believed that there will be sufficient funds available to remove such snags as may be carried into the channel during the coming winter.

Mr. James S. Polhemus, assistant engineer, has been in local charge of this work.

Money statement.

July 1, 1906, balance unexpended	$2,569.26
Amount appropriated by river and harbor act approved March 2, 1907	3,000.00
	5,569.26
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,935.56
July 1, 1907, balance unexpended	3,633.70
July 1, 1907, outstanding liabilities	500.00
July 1, 1907, balance available	3,133.70

APPROPRIATIONS.

June 3, 1896	$5,000
March 3, 1899	3,000
June 13, 1902	2,000
April 5, 1905, allotted from "Improvement of Coos Bay and Harbor, general improvement"	3,000
March 2, 1907	3,000
Total	16,000

COMMERCIAL STATISTICS.

The following commerce was carried by vessels plying Coos River during the year ending December 31, 1906:

Articles.	Inbound.	Outbound.	Articles.	Inbound.	Outbound.
	Tons.	*Tons.*		*Tons.*	*Tons.*
Chittim bark	.....	2	Logs	.....	25,671
Coal	468	74	Lumber	1,402	.....
Cord wood	58	50	Machinery	145	67
Dairy produce	5	2,203	Miscellaneous	1,031	1,046
Eggs	6	23	Piles	.....	760
Fish	.....	69	Rock	.....	220
Fruit	15	506	Spars	.....	56
Grain	61	.....	Vegetables	108	609
Hay	43	228			
Live stock	255	356	Total	3,597	31,940

Number of passengers carried up river, 12,219; number of passengers carried down river, 12,105; total, 24,324.

List of steamers which regularly operated on Coos River during the year ending December 31, 1906.

Name.	Character.	Net tonnage.	Depth.
			Feet.
Adel	Gasoline, screw	6	3.4
Alert	Stern-wheel	81	4.0
Buffalo Bill	Gasoline, screw	6	3.4
Coos River	Steam, screw	8	5.0
Curlew	Gasoline, screw	8	3.5
Juanita	do	9	3.0
Margaretta	do	.....	3.1
Rosebud	do	.....	.....
Sumner	do	.....	4.0
Telephone	do	7	3.0
Tioga	do	.....	3.6

In addition to the above named, there are several gasoline boats and launches in the stream owned and operated by farmers living in the valley. Owing to the formation of the country, transportation other than by water is at present impracticable. The stream is therefore used as a highway for transporting practically all the commerce and passengers of the region.

W W 4.

IMPROVEMENT OF SIUSLAW RIVER, OREGON.

For further information relative to the project for improvement of Siuslaw River, attention is invited to the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

The river and harbor act of March 3, 1905, provided for closing out the works and distributing the serviceable property to other works where active operations are in progress, and also allowed the expenditure of a sufficient amount to maintain the work for two years.

The work of distributing this property had been previously done, and for that reason no work has been done during the fiscal year 1907 and no expenditures have been made.

The period of maintenance has elapsed, and it is therefore recommended that the balance available be restored to the general funds of the Treasury.

It may be stated that the entrance to Siuslaw River is considered not worthy of further improvement at the present time.

Money statement.

July 1, 1906, balance unexpended	$24,838.00
July 1, 1907, balance unexpended	24,838.00

APPROPRIATIONS.

September 19, 1890	$50,000.00	June 13, 1902	$35,000.00
July 13, 1892	20,000.00	Received from sales	150.10
August 18, 1894	25,000.00		
June 3, 1896	27,000.00	Total	187,150.10
March 3, 1899	30,000.00		

COMMERCIAL STATISTICS.

The following commerce was carried by vessels across the bar at the mouth of the Siuslaw River during the year ending December 31, 1906:

Articles.	Inbound.	Outbound.	Articles.	Inbound.	Outbound.
	Tons.	*Tons.*		*Tons.*	*Tons.*
Chittim bark		92	Lumber		11,320
Coal	30		Machinery		14
Dairy produce		37	Miscellaneous	1,223	7
Fish		561	Tinplate	500	
Flour and feed	180		Wool		3
Grain	177				
Laths		200	Total	2,110	12,234

Number of passengers arrived by sea, 14; departed by sea, 9; total, 23.

List of vessels crossing the bar at entrance to Siuslaw River during the year ending December 31, 1906.

Name.	Net tonnage.	Depth	Name.	Net tonnage.	Depth.
Albion	75	5.0	Mayflower	86	6.2
Antelope	117	7.0	Oakland	383	9.5
Coquille	97	6.4	Robarts	131	8.0
Hugh Hogan	355	9.8	Sotoyome	394	10.0
L. Roscoe	75	9.0	Washcalore	303	10.0

W W 5.

IMPROVEMENT OF YAQUINA BAY, OREGON.

For further information relative to the various projects for the improvement of Yaquina Bay, Oregon, attention is invited to the summary of this report.

OPERATIONS DURING FISCAL YEAR 1907.

The river and harbor act of March 3, 1905, provided for closing out the works and distributing the serviceable property to other works where active operations are in progress, and also allowed the expenditure of a sufficient amount to maintain the work for two years.

The work of distributing this property had been previously done and for that reason no work has been done during the fiscal year 1907, and no expenditures have been made.

The period of maintenance has elapsed and it is therefore recommended that the balance available be restored to the general funds of the Treasury.

It may be stated that the entrance to Yaquina Bay is considered not worthy of further improvement at the present time.

Money statement.

July 1, 1906, balance unexpended	$1,661.04
July 1, 1907, balance unexpended	1,661.04

APPROPRIATIONS.

June 14, 1880	$40,000.00	July 13, 1892	$85,000.00
March 3, 1881	10,000.00	August 18, 1894	50,000.00
August 2, 1882	60,000.00	June 3, 1896	25,000.00
July 5, 1884	50,000.00	Deposited account sales	1,889.06
August 5, 1886	75,000.00		
August 11, 1888	150,000.00	Total	711,889.06
September 19, 1890	165,000.00		

COMMERCIAL STATISTICS.

The following commerce was carried by vessels across the bar at the entrance to Yaquina Bay during the year ending December 31, 1906:

Articles.	Inbound.	Outbound.
	Tons.	*Tons.*
Machinery		10
Flour and feed		390
Miscellaneous	90	92
Total	90	492

Passengers, none.

List of vessels crossing the bar at entrance to Yaquina Bay during the year ending December 31, 1906.

Name.	Net tonnage.	Depth.	Name.	Net tonnage.	Depth.
Columbine	212.0	15.0	Robarts	24.0	6.5
Gerald C	24.0	5.2	Triumph	27.3	8.0
L. Roscoe	75.0	9.0	Geo. R. Vosburg	66.0	8.7
Heather		14.9			

W W 6.

IMPROVEMENT OF TILLAMOOK BAY AND BAR, OREGON.

Information concerning the completed project for obtaining a least depth of 9 feet at mean high tide in the channel between Hobsonville, on Tillamook Bay, and Tillamook City, on Hoquarten Slough, as well as the results of operations in former years, is given in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

No active operations were carried on at Tillamook Bay on account of lack of funds until the $10,000 appropriated by the river and harbor act of March 2, 1907, for maintenance of improvement became available.

The freshets of the past winter and spring have caused the channel between Tillamook and deep water in the lower bay to become shoaler than the projected depth. Some snags have been deposited in Hoquarten Slough.

The Government dredge was put into commission about May 1, and the work of removing the snags from Hoquarten Slough commenced. The work of redredging the shoals in the bay channel by hired labor and the Government plant will be commenced about July 1, 1907.

A gasoline launch, 30 feet long by 8 feet beam, fitted with a 10-horsepower Standard engine, has been purchased for this work, to be used in tending on the dredge and towing water and wood scows.

It is estimated that $10,000 will be needed every two years to maintain the project.

Mr. J. S. Polhemus, assistant engineer, has been in local charge of the work.

Money statement.

July 1, 1906, balance unexpended	$2,563.33
Receipts from sales	20.00
Amount appropriated by river and harbor act approved March 2, 1907	10,000.00
	12,583.33
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	3,816.67
July 1, 1907, balance unexpended	8,766.66
July 1, 1907, outstanding liabilities	1,100.00
July 1, 1907, balance available	7,666.66
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	5,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

August 11, 1888	$5,200.00	June 13, 1902	$27,000.00
September 19, 1890	500.00	March 3, 1905	10,000.00
July 13, 1892	15,000.00	March 2, 1907	10,000.00
August 18, 1894	16,000.00	Receipts from sales	20.00
June 3, 1896	17,000.00		
March 3, 1899	25,000.00	Total	125,724.68
November 10, 1900 (refundment of overpayment)	4.68		

CONTRACTS IN FORCE.

Emergency:
Name of contractor: O. P. Graham, Portland, Oreg.
Date of contract: April 19, 1907.
Character: Furnishing and delivering launch.
Price: $1,550.
Approval: Not required.
Dates of beginning and expiration: Launch to be delivered on or before June 1, 1907.

COMMERCIAL STATISTICS.

The following commerce was carried by vessels across the bar at the entrance to Tillamook Bay, Oregon, during the year ending December 31, 1906:

Articles.	Inbound.	Outbound.
	Tons.	*Tons.*
Lumber		5,694
Miscellaneous	5,355	2,578
Total	5,355	8,272

Number of passengers arrived by sea, 621; departed by sea, 748; total, 1,369.

List of vessels crossing the bar at entrance to Tillamook Bay, Oregon, during the year ending December 31, 1906, which proceeded as far as or departed from Tillamook City, Oreg.

Name.	Net tonnage.	Depth.
		Feet.
Abbie	138	8.3
Robarts	24	6.5
Sue H. Elmore	131	8.0

List of vessels crossing the bar at entrance to Tillamook Bay, Oregon, during the year ending December 31, 1906, which did not go above nor depart from above Hobsonville, Oreg.

Name.	Net tonnage.	Depth.
		Feet.
Coquille River	265	12.4
Geo. R. Vosburg	66	8.7

W W 7.

IMPROVING THE VARIOUS HARBORS ON THE COASTS OF OREGON AND WASHINGTON BY THE CONSTRUCTION AND EQUIPMENT OF A DREDGING PLANT FOR USE THEREON.

The river and harbor act of March 2, 1907, appropriated $100,000 for the construction of this dredge, and the funds being made available so recently precluded the possibility of any work being done on the dredge other than to prepare plans and specifications.

Authority was obtained to hire an expert for preparing these plans and specifications, and at the close of the year they were practically completed.

The plans as prepared are for a hydraulic dredge and as the operation of the dredge is to be borne by the different works of improvement on the Oregon and Washington coasts no estimate is made for further appropriations.

Money statement.

July 1, 1906, balance unexpended	$100,000.00
July 1, 1907, balance unexpended	100,000.00

APPROPRIATION.

March 2, 1907	$100,000

W W 8.

IMPROVEMENT OF UPPER COLUMBIA AND SNAKE RIVERS, OREGON, WASHINGTON, AND IDAHO.

For details of this project, with status of improvement, attention is invited to the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

The self-propelling dredge *Wallowa* was in commission from June to November, 1906, dredging and raking gravel bars and constructing wing dams in the Snake River between Lewiston and the railroad crossing at Riparia.

The shoals dredged are those at Log Cabin and Offields; the shoals raked are those at Penewawa, Diamond Crossing, Cox Rapids, Offields, Log Cabin, and Dry Gulch; the wing dams are at Offields and Dry Gulch. These dams were built of rubblestone banked with gravel, 300 and 175 feet long, respectively, and were designed to confine the low-water flow to the improved channels.

The season's operations resulted in giving a channel 40 inches deep at low water, a depth sufficient for continuous navigation by boats of suitable design for a shoal and swift water stream. The boats actually used on this part of the Snake, which are not of suitable design, were taken off from August to October for the alleged reason that the wear and tear was too great and the practicable cargoes not sufficiently remunerative.

There have been no boats running above Lewiston and no work has been done above that point.

The following is a summary of the operations of the *Wallowa:*

Distance moved	miles	1,199
Coal consumed	tons	266
Wood consumed	cords	16
Gravel shoals raked	number	11
Drags made with rake	do	878
Gravel dredged from channel	cubic yards	2,661
Gravel placed in dams	do	900
Rock placed in dams	do	1,635
Total length of dams constructed	linear feet	475
Average monthly cost of operations		$1,480

The *Wallowa* was hauled out on the ways at Riparia and her hull and machinery repaired during the month of November.

Under funds appropriated by the State of Washington for improving the Snake River from Riparia to its mouth, contracts have been let for constructing and equipping three drill scows, to be used in removing bowlders and ledges from the various rapids.

Under the appropriation of $120,000 in the river and harbor act approved March 2, 1907, plans are being prepared for a powerful light-draft steamboat, suitably equipped for raking gravel bars and removing ledges and bowlders. This boat is also intended as tender to drill scows located at various points on the Columbia River between Celilo and the mouth of the Snake River.

It is estimated that in addition to funds now available the sum of $42,000 can profitable be expended on the upper Columbia and Snake rivers during the next two years as follows:

For general improvement, Columbia River	$30,000
For operation of dredge above Riparia	12,000
Total	42,000

Mr. David B. Ogden, assistant engineer, has been in local charge of the work.

Money statements.

FEDERAL APPROPRIATION.

July 1, 1906, balance unexpended		$13,973.71
Amount appropriated by river and harbor act approved March 2, 1907:		
Columbia River to mouth of Snake River		120,000.00
Snake River above Riparia		10,000.00
		143,973.71
June 30, 1907, amount expended during fiscal year, for maintenance of improvement		14,747.08
July 1, 1907, balance unexpended		129,226.63
July 1, 1907, outstanding liabilities		900.00
July 1, 1907, balance available		128,326.63
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$30,000.00	
For maintenance of improvement	12,000.00	
		42,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

STATE APPROPRIATION.

Amount appropriated by the Washington State legislature	$125,000.00
July 1, 1907, balance unexpended	125,000.00
July 1, 1907, outstanding liabilities	2,739.00
July 1, 1907, balance available	122,261.00
July 1, 1907, amount covered by uncompleted contracts	16,331.00

APPROPRIATIONS.

Upper Columbia River:	
June 10, 1872	$50,000.00
June 23, 1874	20,000.00
March 3, 1875	35,000.00
	105,000.00
Upper Columbia and Snake rivers:	
August 14, 1876	15,000.00
June 18, 1878	20,000.00
March 3, 1879	20,000.00
June 14, 1880	15,000.00
March 3, 1881	15,000.00
August 2, 1882	6,000.00
July 5, 1884	20,000.00
August 5, 1886	10,000.00
August 11, 1888	10,000.00
September 19, 1890	20,000.00
July 13, 1892	15,000.00
August 18, 1894	5,000.00
June 3, 1896	5,000.00
March 3, 1899	7,500.00
June 13, 1902	40,250.00
June 13, 1902, balance transferred from improvement of Clearwater River, Idaho	12,294.41
June 13, 1902 (allotted)	5,500.00
March 3, 1905	25,000.00
March 2, 1907	130,000.00
	501,544.41
Receipt from sales	825.70
Total	502,370.11
Snake River:	
Appropriated by State of Washington	125,000.00

CONTRACTS IN FORCE.

Emergency:

Name of contractor: Joseph Supple, Portland, Oreg.
Date of contract: April 25, 1907.
Character: Furnishing and delivering three scows.
Price: $9,825 for three scows.
Approval: Contract authorized by Chief of Engineers, April 9, 1907.
Dates of beginning and expiration: Work to be commenced within ten days and scows to be delivered within one hundred days from date of contract.

Emergency:
Name of contractor: Tatum & Bowen, Portland, Oreg.
Date of contract: April 27, 1907.
Character: Furnishing and delivering three hoisting engines.
Price: $4,221 for three engines.
Approval: Not required.
Dates of beginning and expiration: Engines to be delivered within ninety days from date of contract.

Emergency:
Name of contractor: O. F. Graves, Portland, Oreg.
Date of contract: May 27, 1907.
Character: Furnishing and delivering one gasoline launch.
Price: $2,285.
Approval: Not required.
Dates of beginning and expiration: Launch to be delivered within one hundred and ten days from date of contract.

COMMERCIAL STATISTICS.

The following commerce was carried on the Upper Columbia and Snake rivers during the year ending December 31, 1906:

Articles.	Tons.	Articles.	Tons.
Wheat	29,977	Lumber	2,185
Other cereals	10,046	Cattle and horses	382
Flour	680	Sheep and hogs	207
Machinery	1,252	Cement	3,816
Coal	5,656	Other articles	4,785
Hay	1,056		
Railroad iron, etc	1,663	Total	71,556
General merchandise	9,851		

Number of passengers carried, 24,583.

List of vessels plying the Upper Columbia and Snake rivers during the year ending December 31, 1906.

Name.	Net tonnage.	Depth.	Name.	Net tonnage.	Depth.
		Feet.			*Feet.*
Columbia	106	3.6	Relief	209	4.7
J. M. Hannaford	549	5.5	Spokane	421	6.3
Lewiston	518	6.0	Wallowa	200	5.0
Mountain Gem	282	5.0	W. R. Todd	105	3.8
Norma	452	5.6	Yakima		

W W 9.

IMPROVEMENT OF COLUMBIA RIVER BETWEEN THE FOOT OF THE DALLES RAPIDS AND THE HEAD OF CELILO FALLS, OREGON AND WASHINGTON.

For details of this work, with status of the project, attention is invited to the summary of this report and to report of Board of Engineers printed in the Annual Report of the Chief of Engineers for 1904, page 3475.

OPERATIONS DURING THE FISCAL YEAR 1907.

The work during the fiscal year has been carried on under two contracts—one with Robert Wakefield, dated April 12, 1904, for removal

of submerged rocks in the vicinity of Three Mile Rapids, and one with Smyth & Jones, dated August 10, 1905, covering the construction of a portion of the canal just below Celilo.

Work was in progress under contract with Robert Wakefield from September 1, 1906, to March 1, 1907, when operations were suspended owing to high water. Owing to the short period in which work could be done, very little was accomplished, although at the end of the year all work on the Washington side was completed. It is believed that another low-water season will complete all the excavation covered by the contract and develop a channel 10 feet deep at low water and 250 feet in width, except in one point, where it narrows to 200 feet. The following table shows the amount of each class of rock excavated during the year and the approximate amount of each class remaining to complete the work:

Material.	Total amount.	Excavated during fiscal year 1907.	Previously excavated.	Balance to complete contract.	Contract price.
	Cub. yds.	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*	
Class A rock	42,312	1,764	35,508	5,040	$1.50
Class B rock	9,264	738	6,954	1,572	6.25
Total	51,576	2,502	42,462	6,612	.....

The work done by the contractors on the section of canal under construction has been somewhat delayed owing to freshet in the river and various causes, and the time for completing the work has been extended for a reasonable period. It may be stated, however, that the chief cause of delay is probably bad management. The contractors propose to make some improvements in their plant by the time operations are resumed, and it is hoped that better progress will be made, but it is evident that at least another working season will be required to finish the contract. Operations were suspended on April 13 owing to the usual summer freshet. The highest water occurred on June 4, when the river reached 107 on the gauge at Celilo, which stage is very close to the limit of navigation at Cascade Locks. The following table shows the general progress of the work under each item covered by the contract, also the quantities remaining to complete the work:

Classification.	Contract price per cubic yard.	Estimated quantities.	Work done, fiscal year 1906.	Work done, fiscal year 1907.	Total to June 30, 1907.	Remaining work.
		Cub. yds.	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*
Concrete	$5.33	33,000	3,973	4,583	8,556	24,444
Solid-rock excavation	.90	81,000	19,595	21,423	41,018	39,982
Common excavation	.37	35,700	11,195	5,493	16,699	19,012
Sand excavation	.18½	9,500	2,028	4,428	6,456	3,044
Riprap	1.85	9,000	733	2,520	3,253	5,747

The inspection force during the progress of the work made a resurvey between Celilo and Big Eddy with a view to eliminating some of the curvature in the original location and for the purpose of determining a more detailed plan of construction. This resurvey developed some changes which are necessary and which are generally discussed in the summary of this report.

The State portage road has been operated only intermittently during the year for the reason that suitable boats were not available for navigating above Celilo. A total of 5,630 tons of freight, consisting of wheat, general merchandise, cement, coal, etc.,was handled during the year. The Open River Association have placed a new steamer, the *J. N. Teal*, on the lower section of the river to operate between Portland and Big Eddy, and it is believed that they contemplate providing suitable boats for the upper river in order to handle the increased traffic which will result from adequate facilities for utilizing the boat railway around the obstructions.

Mr. J. S. Polhemus, assistant engineer, has been in charge of the work, with Mr. F. C. Schubert, assistant engineer, as engineer in charge of the field forces.

A further study of the approved project has led the district officer to conclude that several radical changes are desirable, the most important of which is the proposed introduction of an additional lock at Ten Mile Rapids. The arguments in favor of this lock rest upon the following consideration:

The project provides for a boat basin and lock of 19 feet lift at Celilo, a pool 6½ miles long from Celilo to near the head of Five Mile Rapids, a lock of 10 feet lift at this point, a second short pool of about 1¼ miles, and, finally, a flight of two locks with a combined lift of 70 feet at Big Eddy. All the locks and the entire canal are located over ground submerged during high freshets in the Columbia River.

The canal will take its water supply from the pool of the main river above Celilo. The low-water level of this pool fixes the low-water level of the upper lock. This same low-water level is carried through the 6½-mile pool to the lock at Five Mile Rapids, so that the upper lock can be kept open continuously at low water and all lockage done within 1½ miles at the downstream end of the canal. This is a very desirable arrangement and will not be interfered with by the construction of an extra lock at Ten Mile Rapids.

The height of the several locks and lock gates are determined from the condition that they must pass boats until the river rises in freshet periods to a point where navigation is suspended at Cascade Locks. The height of the retaining walls and embankments of the canal trunk are determined by the condition that they must exclude river water until the limiting stage of navigation is reached. Fulfilling this latter condition, the project provides that the retaining walls and embankments of the canal trunk shall have a slope corresponding to the slope of the river and shall at any point be about 2 feet higher than the river will be at the limiting stage of navigation.

Near the upper end of the 6½-mile pool about 6,300 feet of the canal trunk lies across a gravel and sand bar where the foundation and canal embankments will be of exceedingly porous material. To retain water in this portion of the canal during low-water periods it will be necessary to line it throughout with concrete or other impervious material, as is done in irrigation canals, and this lining must be made secure against upward pressure when the river level in freshet periods rises above the level of the water in the canal pool. Without going into details, it suffices to state that if the canal trunk of 6½ miles length is built with retaining walls and embankments, as

projected by the Board, there will be a time as the limit of navigation is reached when the level of the water in the river opposite this permeable section will be from 1 to 7½ feet higher than the highest possible level of the water in the canal pool, giving an upward pressure as high as 469 pounds per square foot upon the concrete lining of the bottom of the canal. This pressure no ordinary lining will resist, and unless at great cost it is made sufficiently thick and heavy to resist this vertical pressure by its own weight it will be necessary to prevent this pressure by allowing the water in the canal pool to rise as rapidly as the river rises and so avoid any upward pressure.

There are two methods by which the water level in the canal can be allowed to go up as the river rises. One is to raise the canal walls and embankments over about 15,000 feet at the lower end of the pool between Five Mile and Ten Mile rapids, about 7½ feet above the height contemplated by the approved project, or to put in a lock at Ten Mile Rapids whose gates could be closed and the water in the pool across the gravel and sand bar could be kept up to a level of the water in the river.

It has been estimated that to raise the wall between Five Mile and Ten Mile rapids high enough to avoid any upward pressure in the sand and gravel section will cost approximately $180,000, and to put in the heavy concrete floors over the 6,300 feet of permeable section will cost approximately $220,000, while the construction of a single lock at Ten Mile Rapids is estimated to cost only $60,000. In other words, if this lock is not built several times its cost will have to be expended in increased height of canal walls and embankments or in increased cost of excessively heavy concrete floors in the permeable section.

In view of the above it is recommended that the additional lock be authorized in the vicinity of Ten Mile Rapids.

Money statement.

July 1, 1906, balance unexpended	$434,900.46
Receipts from sales	4.90
Amount appropriated by river and harbor act approved March 2, 1907	100,000.00
	534,905.36
June 30, 1907, amount expended during fiscal year, for works of improvement	72,208.96
July 1, 1907, balance unexpended	462,696.40
July 1, 1907, outstanding liabilities	20,100.00
July 1, 1907, balance available	442,596.40
July 1, 1907, amount covered by uncompleted contracts	220,904.00
Amount (estimated) required for completion of existing project	3,433,392.64
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	1,000,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

August 18, 1894	$100,000.00	March 2, 1907	$100,000.00
June 3, 1896	150,000.00	Receipts from sales	4.90
April 28, 1904	100,000.00		
March 3, 1905	50,000.00	Total	750,004.90
June 30, 1906	250,000.00		

CONTRACTS IN FORCE.

Formal:

Name of contractor: Robert Wakefield, Portland, Oreg.
Date of contract: April 12, 1904.
Character: Excavating and removing rock.
Approximate quantities to be removed and excavated: 50,000 cubic yards of rock of class A (above low water); 7,000 cubic yards of rock of class B (below low water).
Prices: $1.50 per cubic yard for rock of class A; $6.25 per cubic yard for rock of class B.
Approved: May 3, 1904.
Date of beginning: Thirty days after date of notification of approval.
Date of expiration: May 31, 1905.
Extension: Time for completion extended a reasonable period.

Formal:

Name of contractor: Smyth & Jones, Portland, Oreg.
Date of contract: August 10, 1905.
Character: Constructing portion of Dalles-Celilo Canal.
Approximate quantities (in place), with prices:

33,000 cubic yards plain concrete, at $5.33 per cubic yard.
81,000 cubic yards solid rock excavation, at 90 cents per cubic yard.
12,000 cubic yards sand excavation, at 18½ cents per cubic yard.
43,000 cubic yards common excavation, at 37 cents per cubic yard.
9,000 cubic yards hand-placed riprap, at $1.85 per cubic yard.
100 feet B. M. oak timber, at $87 per M feet B. M.
1,500 feet B. M. fir timber, at $37 per M feet B. M.
200 linear feet test and anchor holes, at $2.50 per linear foot.
3,000 pounds structural steel shapes, at 12½ cents per pound.
105,000 pounds medium steel reenforcing rods, at $3.05 per hundredweight.
2,000 pounds cast iron, at 12½ cents per pound.
2 roller valves, complete, at $2,400 each.
27 tons asphaltic cement, at $50 per ton.
1,000 linear feet drain tile, at 15 cents per linear foot.

Approved: September 2, 1905.
Date of beginning: Thirty days after notification of approval of contract.
Date of expiration: December 31, 1906.
Extension: Time for completion extended a reasonable period.

Supplemental agreement to above contract, dated August 25, 1906, provides that the contractor shall construct a culvert instead of digging the trench called for in specifications attached to original agreement.

Approved: September 12, 1906.

Supplement to above contract, dated October 16, 1906, provides that the United States shall rent one 5-ton locomotive to Smyth & Jones at the rate of $30 per month.

Approved: November 7, 1906.

Expiration of supplemental agreement: Any time after April 20, 1907.

COMMERCIAL STATISTICS.

Statement of traffic handled by Oregon State Portage Railway between Big Eddy and Celilo during the year ending December 31, 1906.

	Tons.		Tons.
Wheat	3,400	Cement	777
Other cereals	37	Sand	150
Machinery	36	Powder	135
Coal	6		
General merchandise	823	Total	5,414
Lumber	50		

Number of passengers, 185.

W W 10.

CANAL AT THE CASCADES, COLUMBIA RIVER, OREGON.

The project for overcoming the obstructions in the Columbia River at the Cascades, Oregon, and the results of operations in former years, are set forth in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

There have been no funds available for finishing uncompleted items of the approved project, and no construction has been in progress during the year. The expenditures actually made were for maintenance and for hire of one watchman.

The next important work to be undertaken toward completing the improvement is the erection of the land wall of the upper lock. The earth bank now takes the place of the lock wall, giving the basin a large capacity, which requires much time to fill and empty. The presence of this earth bank is further objectionable because it passes more or less seepage water, which tends to scour at the foundation of the wing wall. The estimated cost of this item is approximately $100,000.

Another important item is open-channel work below the lower entrance to the canal at points where navigation is endangered by reefs and bowlders, principally the latter, which are occasionally brought down by the strong rapids around the locks. As the locks are useful only as they can be reached over the stretch of river in question, the importance of maintaining a safe, open channel can not be overestimated. The sum of $5,000 could be advantageously expended in removing the worst of these obstructions, and these two items, together with $3,500 as estimated cost of a new office building, form the amount named in the money statement as a profitable expenditure.

Mr. David B. Ogden, assistant engineer, has been in local charge of the work.

Money statement.

July 1, 1906, balance unexpended	$4,005.08
Receipts from sales	229.78
	4,234.86
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,975.01
July 1, 1907, balance unexpended	2,259.85
July 1, 1907, outstanding liabilities	80.00
July 1, 1907, balance available	2,179.85
Amount (estimated) required for completion of existing project	199,260.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	108,500.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

August 14, 1876	$90,000.00	June 3, 1896	$50,000.00
June 18, 1878	150,000.00	June 11, 1896	179,597.00
March 3, 1879	100,000.00	March 3, 1899	75,000.00
June 14, 1880	100,000.00	June 13, 1902	30,000.00
March 3, 1881	100,000.00	March 3, 1905	30,000.00
August 2, 1882	265,000.00	March 3, 1905 (allotted)	1,000.00
July 5, 1884	150,000.00		
August 5, 1886	187,500.00		3,809,000.00
August 11, 1888	300,000.00	Receipts from sales	11,629.48
September 19, 1890	435,000.00		
July 13, 1892	326,250.00	Total	3,820,629.48
March 3, 1893	1,239,653.00		

W W 11.

OPERATING AND CARE OF CANAL AND LOCKS AT THE CASCADES OF THE COLUMBIA RIVER, OREGON.

The canal and locks around the Cascades of the Columbia River are about 150 miles above the mouth of the latter in the Pacific Ocean, and, though not wholly finished, are able to pass steamboats drawing 8 feet of water. They were formally opened to navigation on November 5, 1896.

OPERATIONS DURING THE FISCAL YEAR 1907.

During the fiscal year the locks have been available continuously for the passage of river boats. In addition to the usual care and maintenance the work done during the year included the work of repairing the valve of the lower lock gate on the north side, partially completing the new dredge, placing fenders on the lock walls, and removing some of the old buildings used during construction.

The repairs to the valve necessitated the pumping out of the culvert, removing the valve, constructing a new valve seat and replacing

it. During the time these repairs were being made the locks were operated by the culvert on the south side, so that there was little delay to navigation.

The work of placing the timber fenders for protection to the lock walls was begun in November, and by March all of the fenders had been placed in position on the lock walls.

The machinery of the new dredge was installed, the derrick erected and the dredge ready for dredging operations in December, with the exception of placing spuds to hold her against the strong pull of the machinery. Little dredging was required during the year, and practically no work was done with the dredge except to test the machinery, which worked satisfactorily.

One old bunk house and one old dwelling which had been used in former years during construction were torn down, and the grounds cleared up and made ready for seeding.

On January 9 the water gate in the reservoir was broken by ice and caused the closing of the locks for about forty-six hours.

A break in the 10-inch water main occurred on February 11, which cut off the water supply for the gate engines. This break was repaired on March 5, and the locks were again operated under normal conditions. During the time these repairs were being made the gate engines were operated by means of a duplex pump supplying water to the 10-inch mains.

The work has been under the immediate supervision of Mr. W. L. Clark, inspector.

Money statement.

July 1, 1906, balance unexpended	$3,609.44
Allotted July 10, 1906	14,150.00
	17,759.44
July 30, 1907, amount expended during fiscal year, for maintenance of improvement	9,954.81
July 1, 1907, balance unexpended	7,804.63
July 1, 1907, outstanding liabilities	377.00
July 1, 1907, balance available	7,427.63
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	7,250.00

ALLOTMENTS.

November 4, 1896	$2,500.00	July 12, 1902	$5,500.00
May 21, 1897	350.00	July 8, 1903	5,000.00
August 21, 1897	4,000.00	June 24, 1904	7,100.00
October 30, 1897	1,500.00	May 24, 1905	3,000.00
July 26, 1898	13,869.36	July 3, 1905	18,500.00
July 22, 1899	3,047.77	July 10, 1906	14,150.00
July 25, 1900	11,121.41		
July 19, 1901	2,243.63	Total	91,882.17

COMMERCIAL STATISTICS.

Canal at Cascades, Oreg.—Summary of business, etc., during fiscal year ending June 30, 1907.

Month.	Average gauge readings, 12 m.		Number of lockages.	Locks operated.		Number of passages.			Total.
	Upper.	Lower.				Stern wheel.	Propeller.	Barge or sail.	
1906.				h.	m.				
July	109.2	92.5	132	62	30	130	2	.....	132
August	103.4	84.1	119	39	40	118	1	.....	119
September	100.1	78.5	106	42	45	106	.....	.....	106
October	98.3	76.2	121	32	05	115	6	1	122
November	101.7	81.1	103	18	20	103	.....	.....	103
December	100.9	79.7	114	19	00	107	7	3	117
1907.									
January	98.7	76.6	47	20	25	41	6	.....	47
February	103.0	84.1	77	24	55	77	.....	.....	77
March	103.5	84.1	117	21	05	116	1	1	118
April	107.3	90.1	135	24	35	123	3	.....	126
May	114.2	99.3	123	26	45	122	3	.....	125
June	116.8	103.7	115	28	20	117	.....	.....	117
Total	.....	.....	1,309	360	25	1,275	29	5	1,309

Date.	Registered tonnage.	Freight carried.	Passengers.	Vessels delayed.		
				Number.	Hours.	Mins.
1906.		*Tons.*	*Number.*			
July	50,451	3,357.25	15,625	.....	.....	.....
August	45,294	3,151.00	15,365	.....	.....	.....
September	39,477	4,845.25	7,501	.....	.....	.....
October	37,803	6,250.25	6,469	.....	.....	.....
November	35,614	6,622.00	4,581	.....	.....	.....
December	37,243	7,124.75	4,587	.....	.....	.....
1907.						
January	13,204	2,091.00	1,366	[a] 4	12	55
February	25,162	3,789.25	3,387	.....	.....	.....
March	39,015	5,301.00	5,276	.....	.....	.....
April	46,015	4,070.25	6,705	.....	.....	.....
May	50,043	3,845.50	8,405	.....	.....	.....
June	50,332	3,322.50	9,972	[b] 3	15	40
Total	469,653	53,770.00	89,239	7	28	35

[a] Delayed by ice in canal. [b] Delayed by broken cable.

Statement of traffic passing through canal at Cascades, Oregon, during fiscal year ending June 30, 1907.

BOUND UP.

Date.	Flour.	Miscellaneous grain.	Hay.	Cattle.	Horses.	Sheep.	Wool.
1906.	*Pounds.*	*Pounds.*	*Tons.*	*No.*	*No.*	*No.*	*Pounds.*
July	22,000	68,000	6.00	11	94	44	.....
August	.....	.....	10.00	9	84	.....	.....
September	6,000	66,000	46.00	14	142	90	.....
October	4,000	8,000	44.25	18	194	.....	.....
November	6,500	17,000	33.00	4	162	200	.....
December	14,000	.....	19.00	5	60	.....	.....
1907.							
January	.....	143,000	.....	1	2	.....	.....
February	.....	3,000	.....	7	22	.....	.....
March	56,000	18,500	181.75	5	93	.....	.....
April	.....	36,160	73.50	11	86	.....	4,000
May	8,000	64,000	51.25	4	139	.....	.....
June	.....	.....	.....	4	99	.....	.....
Total	116,500	423,660	464.75	93	1,177	334	4,000

Statement of traffic passing through canal at Cascades, Oregon, etc.—Continued.

Date.	Berries and fruit.	Lumber.	Miscellaneous merchandise.	Coal.	Total cargo.	Passengers.
1906.	*Pounds.*	*Ft. B. M.*	*Tons.*	*Tons.*	*Tons.*	*No.*
July	.....	28,500	1,703.75	.....	1,864.00	8,123
August	20,000	.....	1,710.25	.....	1,947.25	7,617
September	.....	5,000	2,157.00	.....	2,346.75	3,705
October	.....	.....	2,333.25	.....	2,513.75	3,525
November	.....	8,700	2,368.75	.....	2,539.75	2,301
December	.....	.....	2,116.25	.....	2,182.25	2,375
1907.						
January	.....	.....	1,025.00	.....	1,098.25	580
February	.....	3,333	2,248.00	.....	2,271.75	1,677
March	.....	.....	2,661.75	47.50	2,988.75	3,174
April	.....	.....	2,052.25	157.50	2,362.50	3,621
May	.....	20,000	2,152.25	103.25	2,461.75	4,699
June	9,000	.....	2,002.75	40.50	2,112.25	5,118
Total	29,000	65,533	24,531.25	348.75	26,689.00	46,515

BOUND DOWN.

Date.	Wheat.	Flour.	Miscellaneous grain.	Hay.	Cattle.	Horses.	Sheep.
1906.	*Pounds.*	*Pounds.*	*Pounds.*	*Tons.*	*No.*	*No.*	*No.*
July	659,000	380,000	296,500	.....	184	441	845
August	320,000	113,500	153,000	1.50	98	301	2,197
September	2,109,500	89,000	847,500	.....	260	373	3,075
October	4,423,000	173,000	447,500	.....	152	480	4,669
November	5,521,000	50,000	553,000	.....	101	449	.....
December	5,296,000	401,500	443,000	.....	74	320	300
1907.							
January	800,000	265,000	120,000	.....	70	66	.....
February	1,220,000	313,000	623,500	.....	27	233	.....
March	2,280,000	324,000	791,000	2.00	80	353	310
April	1,344,000	496,835	676,380	.....	53	252	.....
May	688,000	201,640	639,690	.....	64	542	.....
June	160,000	140,675	439,630	.....	346	776	.....
Total	24,820,500	2,948,150	6,028,700	3.50	1,509	4,586	11,396

Date.	Miscellaneous live stock.	Wool.	Berries and fruit.	Lumber.	Miscellaneous merchandise.	Total cargo.	Passengers.
1906.	*No.*	*Pounds.*	*Pounds.*	*Ft. B. M.*	*Tons.*	*Tons.*	*No.*
July	45	.....	130,000	34,500	295.50	1,493.25	7,502
August	.....	.....	331,500	38,000	339.25	1,203.75	7,748
September	234	.....	178,000	5,500	345.00	2,498.50	8,796
October	1,572	.....	131,000	25,000	384.25	3,736.50	2,944
November	1,352	.....	66,000	.....	554.75	4,082.25	2,280
December	532	.....	72,000	785,000	366.75	4,942.50	2,212
1907.							
January	80	.....	6,500	150,000	90.00	992.75	786
February	.....	.....	69,000	17,670	219.25	1,517.50	1,710
March	120	.....	52,500	38,476	243.75	2,312.25	2,102
April	75	.....	33,000	15,000	220.50	1,707.75	3,084
May	234	22,150	1,000	15,000	196.50	1,383.75	3,706
June	135	4,000	12,000	.....	165.00	1,210.25	4,854
Total	4,379	26,150	1,082,500	1,124,146	3,420.50	27,081.00	42,724

List of vessels passing through canal at the Cascades, Columbia River, Oregon, during fiscal year ending June 30, 1907.

Name.	Character.	Length.	Breadth.	Depth of hold.	Net tonnage.	Times passed through canal during fiscal year.
		Feet.	*Feet.*	*Feet.*		
Agnes	Propeller steamboat	58.0	14.0	4.6	21	20
Bailey Gatzert	Stern-wheel steamboat	177.3	32.3	8.0	444	80
Barges						5
Capital City	Stern-wheel steamboat	150.2	32.0	5.0	348	179
Chas. R. Spencer	do	152.0	31.8	5.6	409	377
Dalles City	do	150.0	30.9	8.2	323	264
Georgie Burton	do	153.5	31.5	6.5	342	50
Geo. W. Simons	Propeller steamboat	81.5	17.5	4.4	47	6
Harvest Queen	Stern-wheel steamboat	187.0	39.8	9.0	430	2
Hercules	do	160.3	34.0	8.6	293	62
Ione	do	130.4	24.7	5.0	213	2
Joseph Kellogg	do	139.2	26.5	7.2	342	165
J. N. Teal	do	160.0	34.4	5.4	459	16
Lacrosse	Propeller steamboat	49.0	11.0	3.5	3	4
Maja	do	54.1	12.1	5.4	22	2
Pearl	do	44.7	10.2	3.6	8	2
Resolute	do	52.0	12.5	5.0	12	5
Stranger	do	73.6	17.7	6.0	51	1
Telephone	Stern-wheel steamboat	201.5	31.5	8.0	539	56
Ottawa	do	89.0	18.0	5.0	72	1
Total						1,299

Meteorological and gauge records for the year.

Months.	Rainfall.	Days on which rain or snow fell.	Average temperature at 12 m.	Highest readings of gauges.		Lowest readings of gauges.	
				Head of canal.	Foot of canal.	Head of canal.	Foot of canal.
1906.	*Inches.*		° *F.*				
July			88.0	110.3	94.0	106.8	88.8
August	0.09	2	83.3	106.5	88.6	100.8	79.6
September	4.84	7	73.3	101.0	80.4	98.6	76.5
October	7.73	16	63.8	99.0	76.8	98.1	75.8
November	17.84	17	52.5	109.0	92.5	98.4	76.4
December	13.42	22	44.7	102.7	82.2	100.0	78.2
1907.							
January	11.95	15	35.0	102.5	82.4	97.0	73.0
February	9.33	16	45.0	106.1	88.6	99.5	78.5
March	6.64	19	50.5	108.5	91.8	101.5	81.0
April	9.53	12	61.0	110.5	95.0	103.0	83.2
May	1.87	7	69.6	120.2	106.4	108.2	91.7
June	2.19	13	72.0	122.8	118.6	109.7	104.5
Total	85.43	146					

Highest reading at head of canal during the year 122.8
Highest reading at foot of canal during the year 109.7
Lowest reading at head of canal during the year 97.0
Lowest reading at foot of canal during the year 73.0

NOTE.—Reading of adopted low water at head of canal is 96; reading of adopted low water at foot of canal is 72.

W W 12.

IMPROVEMENT OF THE COLUMBIA RIVER BETWEEN VANCOUVER, WASHINGTON, AND THE MOUTH OF WILLAMETTE RIVER.

For details of this work, with status of improvement, attention is invited to the summary of this report, and to report of the Board of Engineers printed in the Annual Report of the Chief of Engineers for 1904, p. 3497 et seq.

OPERATIONS DURING THE FISCAL YEAR 1907.

A survey of the river between Vancouver, Wash., and the mouth of the Willamette was made in September, 1906, for the purpose of ascertaining the condition of the cut dredged in 1905, with a view to redredging. The dredged channel was found to be more or less filled throughout its entire length, the depth at several places being 14 or 15 feet at extreme low water. Dredging operations were commenced in October, under contract, with the 20-inch suction dredge belonging to the port of Portland and continued until January 7, 1907, and resulted in restoring the cut to its original condition—150 feet wide and 20 feet deep at low water—and which gives nearly a straight channel from deep water below the lower end of Hayden Island to deep water nearly opposite Vancouver. The material removed was mostly sand, the greater part of which was deposited along the north shore of Hayden Island. The total amount excavated was 253,415 cubic yards. The dredge was in actual operation 68 days at a contract price of $155 per day, making the cost of dredging approximately 4 cents per cubic yard.

During the low water in September and October an examination of the dike at the head of Hayden Island was made and it was found in such good condition that no repairs were needed at that time.

At the close of the fiscal year the high water in the Columbia River would not permit of an examination being made, but it is believed that the channel will again need dredging and possibly some repairs will be required to the dike.

Mr. J. S. Polhemus, assistant engineer, was in local charge of the work.

Money statement.

July 1, 1906, balance unexpended	$22,495.94
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	11,968.88
July 1, 1907, balance unexpended	10,527.06
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	10,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

July 13, 1892	$33,000
June 3, 1896	67,000
June 6, 1900 (allotment of June 18, 1901)	8,000
February 2, 1900 (refundment of overpayment)	1
June 13, 1902	2,000
March 3, 1905	30,000
June 30, 1906	13,000
Total	153,001

CONTRACT IN FORCE (FORMAL).

Name of contractor: The port of Portland, Portland, Oreg.
Date of contract: July 31, 1905.
Character: Hire of 20-inch suction dredge.
Amount of work: Indefinite.
Price: $155 per day.
Approved: August 30, 1905.
Date of beginning: July 31, 1905.
Date of expiration: July 30, 1907.

APPENDIX X X.

IMPROVEMENT OF WILLAMETTE RIVER, AND OF COLUMBIA RIVER, BELOW THE MOUTH OF THE WILLAMETTE, AND THEIR TRIBUTARIES, OREGON AND WASHINGTON.

REPORT OF LIEUT. COL. S. W. ROESSLER, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Willamette River above Portland, Yamhill and Long Tom rivers, Oregon.
2. Operating and care of lock and dam in Yamhill River, Oregon.
3. Columbia and lower Willamette rivers below Portland, Oregon.
4. Mouth of Columbia River, Oregon and Washington.
5. Clatskanie River, Oregon.
6. Cowlitz and Lewis rivers, Washington.
7. Grays River, Washington.
8. Gauging waters of Columbia River, Oregon and Washington.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., July 3, 1907.

GENERAL: I have the honor to transmit herewith annual report * * * for the fiscal year ending June 30, 1907, for improvement of Willamette River, and of Columbia River below the mouth of the Willamette River, and their tributaries, Oregon and Washington, in my charge.

Very respectfully, your obedient servant,

S. W. ROESSLER,
Lieut. Col., Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

X X 1.

IMPROVEMENT OF WILLAMETTE RIVER ABOVE PORTLAND, AND YAMHILL RIVER, INCLUDING THE MAINTENANCE OF LONG TOM RIVER, OREGON.

The details of this work, with status of improvement, are given in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

During the low-water season of last year gravel bars were dredged at the following points: Salem, Eldridge, Lamberts, Five Islands, Candiani, Rices, Simons, Wheatland, Gervais, Lower Eldridge, Lower Lamberts, Coffee Chute, Ash Island, Clackamas Rapids, Magoons, Meldrums, mouth of Yamhill, Black Dog, Grey Eagle, and Budd Chute. This work was done by the Government dipper dredge, and as a rule the cuts are made just large enough for the steamboats and no larger in order to avoid draining the pools above the shoals. The average dimensions are width 40 feet and depth 3½ to 4 feet at low water. The dredged material is cast to that side of the cut where it is least liable to wash back into the channel. These channels are usually filled up by the winter freshets and have to be dredged each year.

The following is a summary of the operations of the dredge:

Gravel dredged	cubic yards	36,159
Length of channel cut	linear feet	7,934
Time actual dredging	hours	744
Time moving and repairing	do	275
Wood consumed	cords	102
Distance moved	miles	243
Average monthly cost of operation		$836.40

The snag boat *Mathloma* was in commission from June to October and again during the month of February, removing snags throughout the river as far up as Corvallis and Harrisburg. The following is a summary of her operations:

Snags removed by boat	number	772
Snags removed by blasting	do	40
Snags and trees cut from bank	do	363
Total snags and trees removed	do	1,175
Rock removed from channel	cubic yards	65
Powder used	pounds	355
Wood consumed	cords	320
Distance moved	miles	990
Rock delivered, Independence revetment	cubic yards	132
Average monthly cost of operations		$1,317

A repair crew and pile driver constructed temporary dams at head of Clackamas Rapids and at Careys Bend and repaired and extended the existing dams at the head of Lamberts Slough, Matheneys and Candiani bars, and began repairs to revtement at Independence. The following is a summary of this party's operations:

Temporary dam constructed	linear feet	565
Existing dams repaired and extended	do	1,005
Piles driven	number	425
Brush fascines cut and placed	cords	219
Sacked gravel placed	sacks	650
Loose gravel placed	cubic yards	1,067
Area repaired, Independence revetment	square yards	140
Rock used, repairs Independence revetment	cubic yards	149
Rock on bank for Wheatland dam and revetment	do	500
Labor		$2,188.10
Cost repairs and extensions to dams per linear foot		$1.18

Operations of the snag boat, the dredge, and the pile driver were resumed in June, 1907, and will be continued throughout the low-water season, or until the work has been completed.

The principal items of permanent work are the construction of a dam across a chute at Wheatland and the revetment of a portion of the bank where there is a large escapement of water through a side channel, causing shoal bars in the main river immediately below.

The river bank is caving rapidly immediately below the revetment at Independence, and this revetment should be extended a distance of 1,200 feet in order to preserve the present alignment of the bank and channel.

Another piece of permanent work is the construction of a revetment opposite Albany, and this and the revetment below Independence are the two principal pieces of permanent work at present in view.

Mr. David B. Ogden, assistant engineer, has been in local charge of the work.

Money statement.

July 1, 1906, balance unexpended		$22,849.64
Refundment of overpayment		16.95
Amount appropriated by river and harbor act approved March 2, 1907		60,000.00
		82,866.59
June 30, 1907, amount expended during fiscal year, for maintenance of improvement		23,509.95
July 1, 1907, balance unexpended		59,356.64
July 1, 1907, outstanding liabilities		5,700.00
July 1, 1907, balance available		53,656.64
Amount (estimated) required for completion of existing project		103,500.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$24,000.00	
For maintenance of improvement	46,000.00	
		70,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

March 3, 1871	$16,000.00	August 18, 1894 (of which $2,000 was allotted to Yamhill River)	$23,000.00
March 3, 1873	3,000.00	June 3, 1896 (Willamette and Yamhill rivers)	40,000.00
June 23, 1874	7,500.00	June 4, 1897 (Willamette and Yamhill rivers)	160,000.00
March 3, 1875	25,000.00	Allotted from emergency act, June 6, 1900	5,000.00
August 14, 1876	20,000.00	June 13, 1902	68,000.00
June 18, 1878	20,000.00	April 28, 1904 (allotted)	12,000.00
March 3, 1879	12,000.00	March 3, 1905	50,000.00
June 14, 1880	12,000.00	March 2, 1907	60,000.00
March 3, 1881	15,000.00	Refundment of overpayment	16.95
August 2, 1882	5,000.00		
July 5, 1884	10,000.00		
August 5, 1886	10,000.00		
August 11, 1888	29,000.00		
September 19, 1890	11,000.00		
July 13, 1892 (of which $3,000 was allotted to Yamhill River)	30,000.00	Total	643,516.95

NOTE.—By river and harbor act of March 3, 1899, $3,000 was transferred to and expended on improvement of Long Tom River, Oregon.

COMMERCIAL STATISTICS.

The canal and locks at Oregon City overcoming the falls of the Willamette River are owned and operated by the Portland General Electric Company, and the following is a statement for the year ending December 31, 1906, of the traffic passing through them:

Grain	tons	1,879	Pulp	tons	512
Flour and mill stuff	do	3,291	Paper	do	43,735
Coal	do	137	Piling	linear feet	152,800
Wool	do	174	Lumber	feet B. M.	1,254,479
General merchandise	do	18,907	Logs	do	20,959,778
Potatoes	do	1,308	Cattle and horses	number	1,875
Hops	do	1,879	Sheep and hogs	do	46
Paper stock	do	758	Passengers	do	16,556

The following statement of traffic carried on the Willamette River above Portland was compiled from reports of various steamers and transportation companies doing business thereon during the year ending December 31, 1906:

Articles.	Tons.	Articles.	Tons.
Wheat	6,671	Sand and gravel	67,119
Other cereals	468	Wood pulp	1,827
Flour	2,824	Lumber (1,161,200 feet B. M.)	1,858
Potatoes	1,669	Logs (73,726,598 feet B. M.)	147,453
Fruit	367	Piles (99,000 linear feet)	1,980
Hay	2,503	Wood (7,154 cords)	10,731
Hops	180	Other articles	37,273
General merchandise	39,907		
Cattle and horses (number 1,453)	581	Total	383,911
Fuel oil	60,500		

Passengers carried, 41,160.

X X 2.

OPERATING AND CARE OF LOCK AND DAM IN YAMHILL RIVER, OREGON.

OPERATIONS DURING THE FISCAL YEAR 1907.

The lock was closed to navigation because of high water on November 7, 1906, and during the following winter months until April 13 was closed to traffic sixty-one days and open ninety-six days. The lock was open for navigation continuously from July 1 to November 7, 1906, and from April 13, 1907, to the end of the fiscal year, with the exception of forty-eight hours between June 26 and 28, when water in the upper pool was lowered to clean out valves and gratings of snags and drift.

The highest water of the year occurred February 7, 1907, and registred 27.1 feet above top of the lock walls. Logs and driftwood caused some slight damage to the paving below the dam. Otherwise the work suffered no injury.

During the year the lock, dam, adjacent grounds, and general property have been cared for and kept in repair. A small parcel of land between the dwelling house and the lock grounds was purchased, and has been fenced in and partly cleared.

Summary of expenditures made in operating and caring for lock and dam in Yamhill River, Oregon, during the fiscal year ending June 30, 1907, submitted in compliance with river and harbor act of July 5, 1884.

Items of estimate.	Amount expended.
Operating and general care of lock	$1,603.64
Engineering, office expenses, and contingencies	52.50
Total	1,656.14

ALLOTMENTS.

September 19, 1900	$1,460	June 25, 1904	$700
January 18, 1901	1,500	July 3, 1905	1,300
May 24, 1901	23,200	July 10, 1906	1,660
July 12, 1902	2,700		
July 14, 1903	2,300	Total	34,820

COMMERCIAL STATISTICS.

Statement showing traffic through lock and dam in Yamhill River, Oregon, during fiscal year ending June 30, 1907.

Date.	Lock open.	Lock closed.	Number lockages.	Time operating.	Freight carried through lock.	Passengers carried.
1906.	*Days.*	*Days.*		*Hrs. Min.*	*Tons.*	*Number.*
July	31	.....	24	13 47	720	93
August	31	.....	10	6 30	540	3
September	30	.....	1	10	.....	5
October	31	.....	5	1 07	.....	9
November	15	15	.....	.....	.....	.....
December	12	19	2	2 30	135	.....
1907.						
January	22	9	.....	.....	.....	.....
February	17	11	7	4 30	217.5	8
March	31	.....	8	4 58	259.5	13
April	23	7	2	1 20	60	1
May	31	.....	11	6 59	340.5	13
June	30	.....	11	6 47	366	25
Total	304	61	81	48 38	2,638.5	170

The above traffic consisted principally of paper pulp logs, saw logs, and piling, and in addition to this 895,000 feet B. M. of saw logs and pulp logs passed over the dam during high water.

No regular boats have operated above the lock, the lockages being for barges, rafts, launches, and fishing boats.

The relative location of the lock and dam and adjacent points is shown on map published in the Annual Report of the Chief of Engineers for 1903, page 2260.

X X 3.

IMPROVEMENT OF COLUMBIA AND LOWER WILLAMETTE RIVERS BELOW PORTLAND, OREGON.

For further information relative to the improvement of these streams attention is invited to the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

During the fiscal year 1907 the work of improvement has been limited to dredging.

The U. S. dredge *Wm. S. Ludd* was employed in the lower 30 miles of the estuary throughout the year except from November 22 to December 3, December 19 to February 14, and from March 24 to April 16, when she was laid up for repairs. A review of her work is contained in Tables 1 and 2.

The dredge *Columbia*, of the Port of Portland Commission, was hired from September 11, 1906, to February 5, 1907, under contract dated September 4, 1906, and was employed in dredging the worst bars in the upper reaches of the ship channel to Portland. A record of her work is given in Table 3.

The Port of Portland Commission has operated its 20-inch Bowers dredge at different points in the lower Columbia and Willamette rivers, also its 30-inch Bowers dredge when the latter was not employed by the United States, and reports excavation (in cubic yards) as follows:

Dredge *Portland:*		
Above Madison bridge	15,217	
Lower harbor	1,801	
South of Morrison bridge	14,000	
		31,018
Dredge *Columbia:*		
Swan Island channel	110,840	
Above Madison bridge	66,750	
Reeders bar	51,970	
Willow bar	138,500	
Henrici bar	36,750	
		404,810
Total for both dredges		435,828

TABLE No. 1.

Table showing work done by dredge Wm. S. Ladd during the fiscal year ending June 30, 1907.

Locality.	Period at work.	Days working.	Hours pumping.	Material moved.	Depths.		Days repairing machinery.
					Before.	After.	
				Cu. yards.	*Feet.*	*Feet.*	
Harrington Point	July 1 to Aug. 20	42	200	103,566	21	23	1
	Apr. 17 to May 31	35	170	84,564	21½	23½	.....
Pillar Rock	Nov. 1 to Dec. 18	24	71	49,537	20	21	1
	Feb. 14 to Mar. 23	27	118	73,590	22	23	.....
Puget Island bar	Oct. 16 to 31	13	64	42,550	24	25	.....
Coffee Island bar	Sept. 1 to 12; Oct. 1 to 14.	20	105	69,839	21	25	.....
Eureka bar	Aug. 21 to 31; Sept. 13 to 30.	22	123	42,267	22½	25	2
Beacon No. 2 bar	June 1 to 30	25	105	58,694	21½	22½	.....
Total	.....	208	956	519,607	.....	.....	.....

TABLE No. 2.

The following table shows the cost of this dredging, including operating expenses, wages, subsistence, fuel, etc.:

Amount of material moved	cubic yards	519,607
Operating expenses, wages, subsistence, current repairs, etc		$21,313.69
$740\frac{546}{2240}$ tons Carbon Hill coal, at $5.65 per ton	$4,182.37	
$566\frac{2044}{2240}$ tons Carbonado coal, at $7 per ton	3,968.41	
		8,150.78
Total cost of operating		29,464.47
Cost per cubic yard for the fiscal year	cents	5.67
Cost per cubic yard for coal for the fiscal year	do	1.57
Coal consumed per cubic yard	pounds	5.63
Cubic yards dredged per ton of coal		390
Cubic yards per day's dredging		2,498

The following is a statement of the total amount of material removed by the dredge since her construction in 1893:

	Cubic yards.
Total to close of fiscal year 1906	6,384,197
Amount dredged during fiscal year 1907	519,607
Total	6,903,804

TABLE No. 3.

Table showing work done by dredge Columbia during the fiscal year ending June 30, 1907.

Locality.	Dates inclusive.	Days in operation.	Time digging.	Length of cut.	Width of cut.	Cubic yards.	Kind of material.	Ruling depth.
			Hrs. min.	*Feet.*	*Feet.*			*Feet.*
Henrici bar	Sept. 11 to 21, Oct. 6 to 9.	12.0833	213 05	3,730	300	85,990	Sand	26
Mouth Willamette River.	Sept. 22 to Oct. 5.	12.0000	229 55	3,155	300	106,887	do	26
Upper Martins bar.	Oct. 10 to 31	19.0000	359 55	5,070	300	115,038	do	26
Lower Martins bar.	Nov. 1 to 7	6.0000	121 20	2,520	300	60,623	do	26
Slaughter bar	Nov. 8 to Feb. 5.	44.1667	620 45	11,180	300	290,188	Sand and clay.	26
Total		93.25	1,545 00	25,655		658,726		

Cost of hire of dredge, including operating expenses, wages, subsistence, and repairs, at the contract price of $265 per day amounted to $24,348.41.

Cost per cubic yard of material excavated, not including cost of inspection, 3.74 cents.

The cost of inspection was $1,175.

The ruling depth at the end of the fiscal year is about 22 feet at low water except over a small shoal in the Willamette near Linnton. The increase in depth since the beginning of the improvement is about 8 feet.

Plans for a new dredge to replace the *Wm. S. Ladd*, and which was provided for by the act of March 2, 1907, were prepared in the Philadelphia office. Bids for the construction of this dredge were opened on June 7, 1907, and recommendation has been made that the contract for its construction be awarded to the Newport News Ship

Building and Dry Dock Company, of New York, for the sum of $234,500.

Miscellaneous work of repairs to plant were carried on at the Government moorings below Portland and a number of low-water surveys were made for the purpose of defining the channels across the different bars where dredging is frequently required, and an index map [a] showing the bars where dredging has been carried on during the year is transmitted herewith.

Numerous applications for permission to erect fish traps and other structures were examined and acted upon.

This work has been in charge of Mr. Gerald Bagnall, assistant engineer.

Money statement.

July 1, 1906, balance unexpended	$157,953.26
Receipts from sales	347.11
Amount appropriated by river and harbor act approved March 2, 1907	300,000.00
	458,300.37
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	70,916.30
July 1, 1907, balance unexpended	387,384.07
July 1, 1907, outstanding liabilities, including $2,000 allotted to the Philadelphia district for dredge plans and specifications	4,500.00
July 1, 1907, balance available	382,884.07
Amount (estimated) required for completion of existing project	2,498,509.93
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	115,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

Lower Willamette, act of—		
June 23, 1866	$15,000.00	
March 2, 1867	30,000.00	
July 25, 1868 (allotted)	21,000.00	
April 10, 1869 (allotted)	13,365.00	
July 11, 1870	31,000.00	
June 10, 1872	50,000.00	
		$160,365.00
Lower Willamette, from Portland to the sea, act of—		
March 5, 1873	20,000.00	
June 23, 1874	20,000.00	
March 3, 1875	20,000.00	
August 14, 1876	20,000.00	
June 18, 1878	30,000.00	
March 3, 1879	45,000.00	
		155,000.00

[a] Not printed.

Lower Willamette and Columbia, from Portland to sea, including bar at the mouth of Columbia, act of—		
June 14, 1880	$45,000.00	
March 3, 1881	45,000.00	
August 2, 1882	100,000.00	
		$190,000.00
Columbia and Lower Willamette, below Portland, Oreg., act of—		
July 5, 1884	100,000.00	
August 5, 1886	75,000.00	
August 11, 1888	100,000.00	
September 19, 1890	100,000.00	
July 13, 1892	150,000.00	
August 18, 1894	50,000.00	
June 3, 1896	100,000.00	
March 3, 1899	150,000.00	
June 13, 1902	225,000.00	
April 28, 1904 (allotted)	15,000.00	
March 3, 1905	100,000.00	
June 30, 1906	125,000.00	
March 2, 1907	300,000.00	
		1,590,000.00
Receipts from sales		590.88
Refundments of overpayments		36.11
Total		2,095,991.99

CONTRACTS IN FORCE.

Emergency:
- Name of contractor: J. W. Holmes, Portland, Oreg.
- Date of contract: December 30, 1905.
- Character: Furnishing and delivering coal.
- Quantity: Approximately 1,500 tons.
- Price: $5.65 per ton of 2,240 pounds.
- Approved: Contract authorized by Chief of Engineers December 6, 1905.
- Date of beginning: Whenever required after signing of contract.
- Date of expiration: December 31, 1906.

Formal:
- Name of contractor: The Port of Portland, Portland, Oreg.
- Date of contract: September 4, 1906.
- Character: Hire of 30-inch suction dredge.
- Amount of work: Indefinite.
- Price: $265 per day.
- Approved: September 18, 1906.
- Date of beginning: September 18, 1906.
- Date of expiration: June 30, 1908.

Emergency:
- Name of contractor: S. Elmore & Co., Astoria, Oreg.
- Date of contract: January 2, 1907.
- Character: Furnishing and delivering coal.
- Quantity: Approximately 1,000 tons.
- Price: $7 per ton of 2,240 pounds.
- Approved: Contract authorized by Chief of Engineers December 3, 1906.
- Date of beginning: January 2, 1907.
- Date of expiration: June 30, 1907.

Emergency:
Name of contractor: George W. Sanborn, Astoria, Oreg.
Date of contract: January 2, 1907.
Character: Furnishing and delivering coal.
Quantity: Approximately 400 tons.
Price: $7.10 per ton of 2,240 pounds.
Approved: Contract authorized by Chief of Engineers December 3, 1906.
Date of beginning: January 2, 1907.
Date of expiration: June 30, 1907.

COMMERCIAL STATISTICS.

Arrivals and clearances of vessels at Astoria, Oreg., during the year ending December 31, 1906.

[From collector of customs at Astoria, Oreg.]

Vessels.	Coastwise.		Foreign ports.		Total.	
	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
Arrived	1,279	1,618,447	91	258,855	1,370	1,877,302
Cleared	1,248	1,516,342	115	333,700	1,363	1,850,042
Total	2,527	3,134,789	206	592,555	2,733	3,727,344

Commerce for the year ending December 31, 1906.

Value of exports to foreign countries	$73,475.08
Value of imports from foreign countries	21,751.40
Duties collected	7,473.42

Principal article of export was lumber.
Principal articles of import were coal and cement.

Arrivals and clearances of vessels at Portland, Oreg., during the year ending December 31, 1906.

[From collector of customs at Portland, Oreg.]

Vessels.	Coastwise.		Foreign ports.		Total.	
	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
Arrived	503	529,141	41	98,402	544	627,543
Cleared	436	389,936	104	236,386	540	626,322
Total	939	919,077	145	334,788	1,084	1,253,865

Commerce for the year ending December 31, 1906.

Value of exports to foreign countries	$8,407,432.00
Value of imports from foreign countries	3,246,144.00
Duties collected	892,277.45

Registered tonnage, in and out, over Columbia River bar during year ending December 31, 1906.

	Deep-sea vessels.						Coasters.		Total.	
	American.		British.		Other flags.					
	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
Inward to Astoria and Portland	13	12,339	40	116,694	38	129,822	749	743,101	840	1,001,956
Outward from Portland and Astoria	11	10,992	56	169,356	48	153,352	719	670,581	834	1,004,281
Total	24	23,331	96	286,050	86	283,174	1,468	1,413,682	1,674	2,006,237

Total freight, foreign and coastwise, carried in and out over the Columbia River bar during the calendar year 1906, 1,200,973 tons.

Statement showing principal articles and tonnage of foreign exports and imports at Portland, Oreg., during the year ending December 31, 1906.

Articles.	Tons.	Articles.	Tons.
EXPORTED.		IMPORTED.	
Wheat	164,364	Bags, jute	2,399
Flour	59,198	Burlap	4,481
Barley	2,232	Cement	80,045
Cotton	894	Coal	15,689
Printing paper	793	Coffee	105
Beef, canned	15	Coke	3,021
Lumber	185,116	Fire brick and clay	4,920
Machinery	1,450	Iron, pig and bar	5,622
Wire nails	1,457	Malt liquors	35
Wire	209	Manila	475
		Other fibers	550
		Matting	1,129
		Oils	90
		Rice	3,226
		Silk, raw	16
		Spices	198
		Spirits	100
		Sulphur	3,530
		Tapioca	292
		Tea	264
		Tin in bars	264
		Window glass	42
			126,493
		Articles not given by collector of customs	19,255
Total	415,728	Total	145,748

The following is a statement of traffic carried on the Columbia and lower Willamette rivers during the calendar year 1906:

Articles.	Tons.	Articles.	Tons.
Wheat	14,745	Coal	4,789
Other cereals	7,733	Wood pulp	1,827
Flour	15,483	Lumber (19,507,620 feet B. M.)	31,212
Potatoes	13,911	Shingles	1,008
Fruit	5,205	Logs (686,526,899 feet B. M.)	1,373,053
Hay	9,108	Piles (2,869,709 linear feet)	57,394
Fish	25,829	Wood (25,036 cords)	37,554
General merchandise	119,226	Other articles	42,165
Cattle and horses (number, 13,463)	5,385		
Sheep and hogs (number, 21,028)	1,577	Handled by river vessels	2,331,121
Fuel oil	123,500	Handled by seagoing vessels	1,200,973
Sand and gravel	167,164		
Stone	271,876	Total	3,532,094
Railroad iron	1,377		

Passengers carried by river vessels, 354,463,

List of vessels, not including seagoing vessels, plying the Willamette and lower Columbia rivers and their tributaries below Portland, Oreg.; the upper Willamette and Yamhill rivers and their tributaries above Portland, Oreg., during the calendar year 1906.

[Furnished by the inspectors of boilers and hulls at Portland, Oreg.]

Name of vessel.	Net tonnage.	Depth.	Name of vessel.	Net tonnage.	Depth.
		Feet.			*Feet.*
Agnes			Lexington		
Agnes			Lillian B		
Altona	242	4.8	Lottie	47	6.8
America	67	6.2	Lurline	338	6.6
Annie Comings	431	5.6	Mathloma	270	4.0
Arago	90	9.0	Maria	184	5.9
Bailey Gatzert	444	8.0	Mayflower	82	6.0
Beaver	367	6.5	M. F. Henderson	315	7.5
Canby	49	5.4	Mascot	199	5.5
Capitol City	348	5.0	Melville	64	6.9
Cascades	267	5.6	Metlako	122	4.8
Charles R. Spencer	409	6.0	Modoc	354	4.8
Cygnet			Multnomah	34	4.0
Chester	98	3.8	N. R. Lang	381	6.2
Clara			Nahcotta	112	6.5
City of Eugene	214	4.5	Nellie	59	4.2
Colwell	11	3.5	Nestor	31	5.0
Dalles City	323	8.2	Northwest	301	4.8
Diamond O	276	6.6	No Wonder	235	5.6
Edith	37	9.5	Ocklahama	565	8.3
Electro	30	5.3	Oregona	281	5.0
El Hurd	26	6.2	Ottawa	72	5.0
Elkkader	21	4.0	Paloma	112	5.4
Elmore	467	4.5	Pomona	295	6.1
Enterprise	209	4.5	Pronto	72	6.0
Epner			Republic	60	5.0
F. B. Jones	139	7.0	Resolute	12	5.0
Florence			R. Miler	56	6.8
Flyer			Robert T. Lincoln	50	7.0
Georgie Burton	342	6.5	Rowena		
Geo. H. Mendell	90	7.0	Ruth	372	4.6
Geo. H. Williams	98	7.8	Sacajawea	53	5.6
G. M. Walker	125	4.2	Sarah Dixon	278	6.0
G. K. Wentworth	285	7.0	Shamrock	79	6.2
Game Cock	658	7.9	Star	28	5.6
Grey Eagle	162	4.7	Stranger	51	6.0
Harvest Queen	511	9.0	Tahoma	154	6.0
Hassalo	503	8.4	Telegraph	243	8.0
Hazel Weir	44	4.6	T. J. Potter	676	11.4
Hercules	293	8.5	Undine	280	6.6
Hoo-Hoo	16	3.2	Vanguard	51	4.8
Hustler	129	7.0	Victor	27	5.7
Ione	213	5.0	Volga	48	4.0
Iralda	50	3.7	Vulcan	219	7.0
Jemes B. Stephens	16	3.0	Wauna	134	5.2
Jassie Harkins	55	4.2	Wenona	34	6.2
John McCraken	52	8.4	Wenona	51	4.8
Jordan	61	6.2	Wilavis		
Joseph Kellogg	342	7.2	Wm. S. Ladd	700	12.0
Leona	133	4.0	Samson	189	15.6

X X 4.

IMPROVEMENT OF THE MOUTH OF COLUMBIA RIVER, OREGON AND WASHINGTON.

For further information as to the status of this improvement, attention is invited to the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

At the beginning of the fiscal year operations were in progress under an appropriation of $400,000 contained in a special act approved April 23, 1906. These funds were appropriated for and expended in raising the enrockment at the outer and most exposed

part of the jetty where it was not full up to low tide and where the double-track trestle was inadequately supported to resist the heavy waves of the locality. By raising the enrockment to full low tide it was hoped to save the trestle for future extension of the jetty, but this expectation was not fulfilled and much of this trestle was destroyed by the heavy onslaught of the almost unprecedented storms of the past winter.

The stone purchased under this appropriation was obtained under two contracts—one with the Columbia Contract Company at $1.10 per short ton, the other with the Cascades Construction Company at $1.09 per short ton. Between July 1 and August 20, 1906, when the stone supply was stopped, the former company had delivered 92,107 tons and the latter 21,308 tons, making, with the previous fiscal year's deliveries of the same contractors, a total of 229,528 tons under this special act. This rock was placed where it was most needed, and at the end of the season's work, on August 20, 1,980 feet of the jetty outside Clatsop Spit had been raised to a level of about 4 feet above mean lower low tide and 5,922 feet of jetty seaward of that had been raised to low tide level, the low tide enrockment terminating at a point 31,108 feet from the root of the jetty at Fort Stevens.

A large amount of trestle has been built during the year giving practically a new double track between the shore to a point within 6,000 feet of the extreme end of the trestle. Excepting about 2,000 feet of it, the reconstructed trestle is not exposed to heavy seas and will last until the jetty is completed. This rebuilding was necessary because the old trestle was found to be dry rotted to a point where it was no longer safe to support heavy train loads of stone. The total length of trestle so rebuilt and repaired was 21,106 linear feet. This included 2,098 feet of new trestle over a portion of the enrockment beyond the sands where stone was afterwards added, 5,008 feet of trestle repaired across the sands, 10,884 feet of new trestle, and 3,116 feet of repaired trestle inside the sands.

Besides this extensive repair work on the trestle, many necessary repairs have been made to the rolling plant, the wharves, tracks, and hoisting equipment at the wharves.

All the cars have been taken out, badly rusted iron posts cleaned by sand blast, woodwork renewed where necessary, and all parts thoroughly painted. Locomotives and derrick outfits overhauled, two new tender cars built, bogies put under seven stiff-leg cars, pile driver *No. 1* repaired and given new boiler, temportry wharf pile driver built, and ironwork for twenty new geared dump cars prepared.

New piles have been driven under Dock B and its floor rebuilt, turntables overhauled and one rebuilt, old No. 5 derrick replaced by new one, and two new smokestacks set up over boiler on the wharves. The yard tracks were relined and surfaced up, switches overhauled, and many new ties placed. A new corrugated-iron storehouse has been built and a temporary one set up for the sand-blast outfit. Much repair work has been done on rotten foundation sills and underpinning of most of the buildings, and a new strengthening frame has been set up in the machine shop.

A survey party was held in readiness at Fort Stevens from October 23 to January 15 to survey the bar in order to learn something of

the changes which pilots and others believed to be going on at the point where from last year's survey there were strong indications of the formation of a new and deeper channel. The attempt was abandoned after nearly three months' waiting, the bar being continuously rough. The annual survey was made in June, 1907, and a tracing[a] showing the soundings is transmitted herewith. Remarks regarding the changes which have occurred since the previous survey will be found in the summary of this report.

The dredge *Chinook* is out of commission and no dredging has been done during the year. Her boilers are in bad condition and quite extensive repairs will be necessary before she could be made serviceable.

There has been delivered and dumped on the jetty during the year a total of 147,840 tons of stone. Of this amount, 34,425 tons were purchased in open market during May and June, pending advertisement and making of an agreement for purchase of approximately 1,200,000 tons under continuing contract. This contract has been made on a basis of $1.12 per short ton for 1,000,000 tons of jetty stone and $1.10 per short ton for 200,000 tons of foundation stone and has been forwarded for approval. It is expected deliveries will commence in July.

Mr. Gerald Bagnall, assistant engineer, has been in local charge of the work.

The operation of placing rock in the jetty, under the special act of April 23, 1906, was begun in May and stopped August 20, 1906, when the funds were exhausted. Two hundred and twenty-nine thousand five hundred and twenty-eight tons of stone were added to the jetty under this act, and at the close of the season's work 4,078 feet of jetty seaward of Clatsop Spit had been raised to a level of 4 feet above mean lower low tide and 5,922 feet of jetty seaward of that had been raised to low tide level, the enrockment terminating at a point 31,108 feet from the root of the jetty at Fort Stevens.

The purpose of this special act of 1906 was to raise low parts of the enrockment previously constructed to at least low-tide level, this being deemed necessary to enable the trestle to withstand the heavy breakers of the locality. Without the support which the additional rock would give there was no hope that the exposed portion of the trestle would stand through the winter and be available for the present year's use, while there was good reason to believe that the higher enrockment would support the trestle through an ordinary winter, in which event subsequent work of jetty extension would be greatly facilitated and the ultimate cost lessened much more than the mere cost of the trestle. The attempt to hold the trestle was, however, not successful on account of the terrific onslaught of the seas of an almost unprecedented severe winter. Weakened somewhat by teredo, about 5,364 feet of the tramway were carried away between January and March.

When operations were resumed the present season under the last appropriation, the end of the trestle was at a point 25,744 feet from Fort Stevens, or 5,364 feet from the outer end of the enrockment. There are two methods, and two methods only, by which operations of extending the jetty work could be continued. One was to replace

[a] Not printed.

the destroyed trestle by a parallel one either on the channel side or on the sea side of the enrockment and to carry this trestle out to and curve it in on the line of the present enrockment at the outer end and to continue the jetty extension from that point. There are several serious objections to this plan. One is that if placed on the channel face of the enrockment it would stand in a strong tidal current which would cause a great deal of scour at the base and possibly undermine many of the piles that had been driven, while if placed on the sea side it would be exposed to the full force of the seas and stand in the position least favorable to withstand the impact of the breakers. In either position the trestle would be a high one, measured from the sand bottom up to the rails, and would be liable to sway excessively in a running sea and be unsafe for the transportation of heavy loaded trains except in fairly calm weather, and such a trestle, unsupported as it would be by any enrockment at the base, would be likely to suffer serious injury or possible destruction in a heavy storm, and could not possibly last over a single winter and would have to be replaced at the loss of a great deal of time before work could be resumed the following season. The second possible method of continuing the work was to restore the trestle along the line of the present enrockment, adding enough stone to the present enrockment to give the trestle, of which many piles might have only limited penetration, the necessary support to resist wave action. The work of last year included the building of about 2,098 feet of trestle along the line of a portion of the old jetty of 1893, which had been flattened out by the action of the sea, and while the progress of the pile driving was very slow it was found possible by sloping and staggering the piles, where necessary, to find penetration between the larger rock of the standing jetty to erect a trestle over the existing enrockment. The enrockment in this case was raised to the level of about 4 feet above mid tide in order to give good support to some of the piles which did not have much penetration into the rocks. The tramway so built along the line of the old enrockment and supported to the level of mid tide by rock has withstood the storms of the past winter while, as stated above, over 5,000 feet of trestle were destroyed beyond that point where the enrockment had been raised up only to the level of low tide. It is true, however, that the destroyed portion of the trestle had been very much weakened by the ravages of the teredo, but it is believed that even in its weakened condition it would have stood up during the winter if it had had greater support at and above low water, and this belief is founded not only upon the experience acquired here, but upon the well-established fact that where the enrockment is raised up to nearly full tide—as Grays Harbor, Coos Bay, and other points—the trestle will remain standing for many years, notwithstanding the ravages of the teredo at and below the level of low water.

After consideration of these methods by the district officer, the Chief of Engineers approved a plan for restoring the trestle along the line of the present enrockment and of raising the enrockment to the level of mid tide over the entire width of the trestle instead of limiting the width to only 8 feet, as in the original plan, this latter width being found insufficient. This work of extension under a new appropriation was begun in May and has been intermittently carried on by the purchase of stone in open market until a formal contract

could be made. The deliveries of stone have been irregular and very unsatisfactory, despite the efforts of the contractor, who, it is believed, has done all that is possible to meet the requirements. The difficulty of obtaining labor, a strike at the quarry, and lack of floating plant has been the main reason for the slowness and irregularity of the deliveries. Bids were opened on June 17, 1907, for the entire supply of stone required, the price being $1.12 per short ton for a lot of 1,000,000 tons and $1.10 per short ton for a lot of 200,000 tons. The contract has not been approved at the end of the fiscal year, but it is expected that large and regular deliveries will be promptly established.

Between the work above referred to and the shore is a long line of trestle, partly across the sands of Clatsop Spit and partly over a submerged area where the channel was formerly located which had become so dry-rotted as to be practically unsafe for conveying heavy train loads of stone. The length of this trestle is about 19,000 feet, and practically all of it has been rebuilt or reconstructed during the last fiscal year so as to be practically new. Besides this extensive repair work for the trestle, many necessary repairs have been made to the rolling plant, tracks, hoisting equipment, the wharves, and buildings.

Money statement.

July 1, 1906, balance unexpended	$665,757.99
Receipts from sales	207.25
Amount appropriated by river and harbor act approved March 2, 1907	750,244.00
	1,416,209.24
June 30, 1907, amount expended during fiscal year, for works of improvement	702,404.60
July 1, 1907, balance unexpended	713,804.64
July 1, 1907, outstanding liabilities	53,000.00
July 1, 1907, balance available	660,804.64
July 1, 1907, amount covered by uncompleted contracts	30,155.00
Amount (estimated) required for completion of existing project, not including the north jetty	1,700,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	1,700,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897.	

APPROPRIATIONS.

July 5, 1884	$100,000.00
August 5, 1886	187,500.00
August 11, 1888	500,000.00
February 22, 1890	75,000.00
September 19, 1890	475,000.00
July 13, 1892	350,000.00
August 18, 1894	338,180.00
Total	2,025,680.00
June 3, 1896, transferred to credit of improvement of Columbia River below Tongue Point	50,000.00
Balance	1,975,680.00

June 6, 1900	$250,000.00
June 13, 1902	500,000.00
March 3, 1903	1,000,000.00
March 3, 1905	400,000.00
April 23, 1906	400,000.00
June 30, 1906	300,000.00
March 2, 1907	750,244.00
Receipts from sales	1,372.19
Refundments of overpayments	2.00
Total	5,577,298.19

CONTRACTS IN FORCE (EMERGENCY).

Name of contractor: George W. Sanborn, Astoria, Oreg.
Date of contract: December 30, 1905.
Character: Furnishing and delivering coal.
Quantity: Approximately 600 tons.
Price: $5.55 per ton of 2,240 pounds.
Approved: Contract authorized by Chief of Engineers December 6, 1905.
Date of beginning: Whenever required after signing of contract.
Date of expiration: December 31, 1906.

Name of contractor: Cascades Contract Company, Portland, Oreg.
Date of contract: May 5, 1906.
Character: Furnishing and delivering stone.
Quantity: 50,000 tons.
Price: $1.09 per ton of 2,000 pounds.
Approved: Contract authorized by Chief of Engineers May 5, 1906.
Date of beginning: Ten days after date of contract.
Date of expiration: When stone called for is delivered (August 20, 1906).

Name of contractor: Columbia Contract Company, Portland, Oreg.
Date of contract: May 5, 1906.
Character: Furnishing and delivering stone.
Quantity: 160,000 tons.
Price: $1.10 per ton of 2,000 pounds.
Approved: Contract authorized by Chief of Engineers May 5, 1906.
Date of beginning: Date of contract.
Date of expiration: When stone called for is delivered (August 20, 1906).

Name of contractor: Gorman & Brewster, Portland, Oreg.
Date of contract: May 31, 1906.
Character: Furnishing and delivering pile timber.
Quantity: Approximate quantities with prices: 25,000 linear feet, at 9½ cents per linear foot; 23,250 linear feet, at 11 cents per linear foot.
Approved: Approval not required.
Date of beginning: Immediately after signing contract.
Date of expiration: July 14, 1906.

Name of contractor: City Lumber and Box Company, Astoria, Oreg.
Date of contract: June 5, 1906.
Character: Furnishing and delivering lumber.
Quantity: About 399,000 feet B. M.
Price: Average $17.18 per 1,000 feet B. M.
Approval: Contract authorized by Chief of Engineers June 2, 1906.
Date of beginning and expiration: All lumber to be delivered within thirty days after date of contract.

Name of contractor: Eastern and Western Lumber Company, Portland, Oreg.
Date of contract: October 29, 1906.
Character: Furnishing and delivering lumber.
Quantities, with prices: 275 pieces 12 by 14 inches by 22 feet, rough, at $16.50 per thousand feet B. M.; 165 pieces 12 by 16 inches by 32 feet, rough, at $17.50 per thousand feet B. M.; 3,000 pieces 5 by 6 inches by 5 feet 6 inches, S-1-S, at $16.50 per thousand feet B. M.
Approved: Approval not required.
Date of beginning and expiration: All lumber to be delivered within thirty days from date of contract.

Name of contractor: City Lumber and Box Company, Astoria, Oreg.
Date of contract: November 26, 1906.
Character: Furnishing and delivering lumber.
Quantities, with prices f. o. b. cars at Fort Stevens, Oreg.: 520 pieces 12 by 14 inches by 22 feet, rough, at $17 per thousand feet B. M.; 1,220 pieces 12 by 16 inches by 36 feet, rough, at $18.50 per thousand feet B. M.; 17,000 pieces 5 by 6 inches by 5 feet 6 inches, S-1-S, at $16.50 per thousand feet B. M.; 200 pieces 5 by 6 inches by 12 feet, S-2-S, at $16.50 per thousand feet B. M.; 1,100 pieces 3 by 8 inches by 26 feet, rough, at $15.50 per thousand feet B. M.; 200 pieces 2 by 12 inches by 18 feet, rough, at $15.50 per thousand feet B. M.; 50,000 feet B. M. 1 by 8 inches, rough, at $16.50 per thousand feet B. M.
Approved: November 5, 1906.
Date of beginning: On or before December 24, 1906.
Date of expiration: March 24, 1907.
Extension: Time for completion extended a reasonable period.
Supplemental agreement, dated December 14, 1906, provides that the contractor shall deliver approximately three-fourths of the lumber contracted for on board cars at Fort Stevens, Oreg., and the balance, or approximately one-fourth, on board Government barge at his wharf. The prices to be paid for the lumber delivered on board Government barge to be $1 per thousand feet B. M. less than the prices specified for delivery on board cars at Fort Stevens, Oreg.
Supplemental agreement was approved by Chief of Engineers February 4, 1907.

Name of contractor: George W. Sanborn, Astoria, Oreg.
Date of contract: January 2, 1907.
Character: Furnishing and delivering coal.
Quantity: Approximately 400 tons.
Price: $7 per ton of 2,240 pounds.
Approved: Contract authorized by Chief of Engineers December 3, 1906.
Date of beginning: January 2, 1907.
Date of expiration: June 30, 1907.

Name of contractor: William Gorman, Stella, Wash.
Date of contract: January 20, 1907.
Character: Furnishing and delivering pile timber.
Quantities: 500 sticks, each 50 feet long; 400 sticks, each 45 feet long; 100 sticks, each 40 feet long; 100 sticks, each 30 feet long.
Price: 11½ cents per linear foot.
Approved: Contract authorized by Chief of Engineers November 5, 1906.
Date of beginning: February 20, 1907.
Date of expiration: April 30, 1907.

Name of contractor: W. T. O'Brien, Portland, Oreg.
Date of contract: April 3, 1907.
Character: Furnishing and delivering rails, etc.
Quantities, with prices: 120 tons 40-pound steel rails, complete, at $50.85 per long ton; splice bars and bolts for 50 long tons rails, at 76 cents per set; 1,000 sets (extra) splice bars and bolts, at 76 cents per set; 14,000 pounds railroad spikes, ½ by 4½ inches, at $3.40 per hundredweight.
Approved: Contract authorized by Chief of Engineers March 29, 1907.
Date of beginning and expiration: 70 tons rails to be delivered within fifteen days from date of contract; 50 tons rails to be delivered within thirty days from date of contract; 700 sets splice bars to be delivered immediately, balance within forty days; 14,000 pounds railroad spikes to be delivered immediately.

Name of contractor: City Lumber and Box Company, Astoria, Oreg.
Date of contract: April 4, 1907.
Character: Furnishing and delivering lumber.
Quantities, with prices: 750 pieces, 12 by 16 inches by 36 feet, rough, at $18.50 per thousand feet B. M.; 360 pieces, 12 by 14 inches by 22 feet, rough, at $17 per thousand feet B. M.; 8,500 pieces, 5 by 6 inches by 5 feet 6 inches, S–1–S, at $16.50 per thousand feet B. M.; 500 pieces, 5 by 6 inches by 12 feet, S–1–S, at $16.50 per thousand feet B. M.; 750 pieces, 6 by 6 inches by 20 feet, rough, at $15.50 per thousand feet B. M.; 800 pieces, 3 by 12 inches by 16 feet, rough, at $15.50 per thousand feet B. M.; 200 pieces, 2 by 12 inches by 18 feet, rough, at $15.50 per thousand feet B. M.; 27,000 feet B. M., 1 by 8 inches, rough, at $16.50 per thousand feet B. M.
Approved: Contract authorized by Chief of Engineers March 29, 1907.
Date of beginning: On or before April 30, 1907.
Date of expiration: July 31, 1907.

Name of contractor: Gorman & Brewster, Stella, Wash.
Date of contract: April 17, 1907.
Character: Furnishing and delivering pile timber.
Quantities, with prices: 240 sticks, each from 50 to 55 feet long, at 13½ cents per linear foot; 97 sticks, each from 70 to 75 feet long, at 13½ cents per linear foot; 133 sticks, each from 76 to 80 feet long, at 14 cents per linear foot; 21 sticks, each from 81 to 85 feet long, at 14 cents per linear foot; 13 sticks, each from 86 to 90 feet long, at 14 cents per linear foot.
Approved: Contract authorized by Chief of Engineers March 29, 1907.
Date of beginning and expiration: All pile timber to be delivered within seventy-five days from date of contract.

Name of contractor: Tatum & Bowen, Portland, Oreg.
Date of contract: May 8, 1907.
Character: Furnishing and delivering hoisting engines.
Quantity: Two.
Price: $2,100 each.
Approved: Approval not required.
Date of beginning and expiration: Both engines to be delivered within ninety days from date of contract.

X X 5.

IMPROVEMENT OF CLATSKANIE RIVER, OREGON.

For details of this work, with status of improvement, see summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

No work was done on the river during the fiscal year. The expenditures have been applied to an examination of the river. The boats have made regular uninterrupted trips to Clatskanie without difficulty.

It is believed that a small amount of dredging may be necessary to maintain the improvement, and the amount named as the profitable expenditure, added to the balance available, will be applied to that purpose.

Money statement.

July 1, 1906, balance unexpended	$917.48
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	4.95
July 1, 1907, balance unexpended	912.53
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	500.00

APPROPRIATION.

March 3, 1899 ..... $13,000

COMMERCIAL STATISTICS.

The following statement of traffic carried on the Clatskanie River was compiled from reports of various steamers and transportation companies doing business thereon during the year ending December 31, 1906:

Articles.	Tons.	Articles.	Tons.
Cereals	83	Logs (2,230,000 feet B. M.)	4,460
Flour	10	Piles (10,000 linear feet)	200
Potatoes	80	Shingles	490
Hay	12	Other articles	40
General merchandise	1,425		
Cattle and horses (number, 10)	4	Total	10,339
Lumber (2,121,035 feet B. M.)	3,535		

X X 6.

IMPROVEMENT OF COWLITZ AND LEWIS RIVERS, WASHINGTON.

For details of this work with status of improvement, see summary of this report.

(A) OPERATIONS DURING FISCAL YEAR 1907 FOR COWLITZ RIVER, WASHINGTON.

Work on the Cowlitz River during the fiscal year has consisted entirely of snagging on the lower 36 miles between the mouth and Toledo. This work has been done by the snag boat *Mathloma*, and by blasting crews in small boats.

The operations of the snag boat were carried on during December and January and were confined to removing a number of old piling and the accumulation in and about the mouth of the river. During January unusual freshets occurred in the Cowlitz River, which severely injured the banks and several points and washed many snags into the channel. In February, the upper portion of the river between

Castle Rock and Toledo became more or less obstructed with snags and trees, and these were removed by a blasting crew in small boats. In March, the snags on the stretch of river between Castle Rock and Kelso were removed by blasting.

Just below Castle Rock the winter freshets washed a deep channel across a peninsula, which threatens at another high water to divide the river and thus injure the navigable channel. The last river and harbor act made provision for the construction of a revetment at this point, and at the close of the fiscal year operations are about to begin on this work. Arrangements are also being made to begin dredging on the shoals between Castle Rock and Toledo.

The following is a summary of the operations on Cowlitz River during the year:

Snags removed by boat	number	38
Snags and trees cut from bank	do	10
Snags removed by blasting	do	24
Powder used	pounds	500

The balance of funds available for this work will be required to construct the revetment at Castle Rock and complete the dredging and snagging on the river, and it is estimated that an additional sum of $5,000 will be required for continuing the work of snagging and dredging. This amount is therefore named as that which can be profitably expended during the next two years.

Money statement.

July 1, 1906, balance unexpended	$1,676.78
Amount allotted by river and harbor act approved March 2, 1907	12,500.00
	14,176.78
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,285.03
July 1, 1907, balance unexpended	12,891.75
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	5,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.

APPROPRIATIONS.

June 14, 1880	$2,000	August 18, 1894	$3,000
March 3, 1881	1,000	June 3, 1896	3,000
August 2, 1882	1,000	March 3, 1899	3,000
July 5, 1884	2,000	June 13, 1902 (allotted)	4,750
August 5, 1886	2,000	March 3, 1905 (allotted)	4,400
August 11, 1888	3,000	March 2, 1907 (allotted)	12,500
September 19, 1890	8,000		
June 13, 1892	3,000	Total	52,650

COMMERCIAL STATISTICS.

The following statement of traffic carried on the Cowlitz River was compiled from reports of various steamers and transportation companies doing business thereon during the year ending December 31, 1906:

Articles.	Tons.	Articles.	Tons.
Potatoes	1,455	Railroad iron	205
Fruit	50	Lumber (1,260,600 feet B. M.)	2,017
Hay	1,283	Logs (184,357,000 feet B. M.)	368,714
Hops	74	Piles (1,076,000 linear feet)	21,520
Fish	327	Wood (7,600 cords)	11,400
General merchandise	17,612		
Cattle and horses (number, 382)	153	Total	424,823
Sheep and hogs (number, 180)	13		

Passengers carried, 1,117.

(B) OPERATIONS DURING THE FISCAL YEAR 1907 FOR LEWIS RIVER, WASHINGTON.

Work on the Lewis River has consisted wholly of snagging during the past fiscal year. During the months of December, January, and March this work was thoroughly done by the snag boat *Mathloma* on the North Fork as far as Hayes Bend, 12½ miles above the mouth; on the East Fork to La Center, 7 miles above the mouth.

The following is a summary of the operations on Lewis River during the year:

Snags removed by boats	number	320
Snags and trees cut from bank	do	143
Snags blasted	do	4
Powder used	pounds	100
Distance moved by boat	miles	512
Wood consumed	cords	80
Average monthly cost of operations		$1,317

The balance of funds available for Lewis River will be required for dredging and snagging operations, and it is estimated that an additional sum of $2,500 will be required for continuing the work of snagging and dredging, and that this amount can, therefore, be profitably expended during the next two years.

Money statement.

July 1, 1906, balance unexpended	$4,937.18
Amount allotted by river and harbor act approved March 2, 1907	2,500.00
	7,437.18
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	2,862.25
July 1, 1907, balance unexpended	4,574.93
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.	2,500.00

APPROPRIATIONS.

Act of March 3, 1899	$10,000	March 2, 1907 (allotted)	$2,500
June 13, 1902 (allotted)	4,750		
March 3, 1905 (allotted)	5,600	Total	22,850

COMMERCIAL STATISTICS.

The following statement of traffic carried on the Lewis River was compiled from reports of various steamers and transportation companies doing business thereon during the year ending December 31, 1906:

Articles.	Tons.	Articles.	Tons.
Wheat	1,976	Cattle and horses (number, 1,690)	576
Potatoes	4,560	Sheep and hogs (number, 1,635)	122
Fruit	158	Lumber (1,036,000 feet B. M.)	1,658
Hay	1,160	Logs (60,528,000 feet B. M.)	121,056
Fish	195	Piles (117,000 linear feet)	2,340
Wool	42		
General merchandise	6,237	Total	140,080

Passengers carried, 16,614.

X X 7.

IMPROVEMENT OF GRAYS RIVER, WASHINGTON.

Grays River is a tributary of the Columbia, emptying into Grays Bay on the Washington side nearly opposite Astoria, Oreg., and further details as to the existing conditions will be found in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1907.

The river and harbor act of March 2, 1907, appropriated $2,500 for the removal of stumps, logs, and overhanging trees to a point about 8 miles above the mouth.

The proposed work can best be done during the summer and fall season, and for this reason no operations have been carried on during the fiscal year.

It is proposed to do the work with blasting crew in small boats or with the snag boat *Mathloma* when it can be spared from the upper Willamette River.

Money statement.

Amount appropriated by river and harbor act approved March 2, 1907	$2,500.00
July 1, 1907, balance unexpended	2,500.00

APPROPRIATION.

March 2, 1907 ..... $2,500

X X 8.

GAUGING WATERS OF COLUMBIA RIVER, OREGON.

OPERATIONS DURING THE FISCAL YEAR 1907.

A self-registering tide gauge at Fort Stevens, Oreg., has been kept in operation during the fiscal year, and daily bulletins of the gauge readings have been exhibited for the information of persons interested in navigation of the Columbia River.

A tide gauge was also established in the Columbia River near the mouth of the Willamette and daily record of the readings kept.

In view of the importance of these gauge readings as a benefit to pilots and others, the keeping of the records is considered a worthy object.

The amount expended during the year was for the hire of gauge keepers.

Money statement.

July 1, 1906, balance unexpended	$1,873.44
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	260.04
July 1, 1907, balance unexpended	1,613.40
July 1, 1907, outstanding liabilities	21.00
July 1, 1907, balance available	1,592.40
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 Submitted in compliance with requirements of sundry civil act of June 4, 1897.	1,000.00

APPROPRIATIONS.

August 2, 1882	$500	March 3, 1899	$1,000
July 5, 1884	1,000	June 13, 1902	1,000
August 5, 1886	1,000	March 3, 1905	1,000
August 11, 1888	2,500		
August 18, 1894	1,000	Total	10,000
June 3, 1896	1,000		

APPENDIX Y Y.

IMPROVEMENT OF CERTAIN RIVERS AND HARBORS IN WASHINGTON.

REPORT OF MAJ. H. M. CHITTENDEN, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Willapa River and Harbor, Washington.
2. Grays Harbor and bar entrance, Washington.
3. Grays Harbor, inner portion, between Aberdeen and the entrance to said harbor and Chehalis River, Washington.
4. Puget Sound and its tributary waters, Washington.
5. Inspection, etc., of fish traps, Puget Sound, Washington.
6. Harbor at Olympia, Wash.
7. Tacoma Harbor, Washington.
8. Waterway connecting Puget Sound with Lakes Union and Washington, Washington.
9. Everett Harbor, Washington.
10. Swinomish Slough, Washington.
11. New Whatcom Harbor, Washington.
12. Improving Columbia River between Wenatchee and Bridgeport, Wash.
13. Okanogan and Pend Oreille rivers, Washington.

UNITED STATES ENGINEER OFFICE,
Seattle, Wash., July 2, 1907.

GENERAL: I have the honor to forward herewith * * * annual * * * reports of the river and harbor works in my charge for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

H. M. CHITTENDEN,
Major, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

Y Y 1.

IMPROVEMENT OF WILLAPA RIVER AND HARBOR, WASHINGTON.

There were no operations during the year.

Advertisements have been issued for bids on dredging work at South Bend under appropriation of $25,000, act of March 2, 1907.

Several inspections of the existing works, which consist of dikes near South Bend and of North and Nasel rivers, were made during the year, but no work was done.

The survey and map of harbor lines at South Bend were completed.

Money statement.

July 1, 1906, balance unexpended	$1,183.96
Amount appropriated by river and harbor act approved March 2, 1907	25,000.00
	26,183.96
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	1,004.52
July 1, 1907, balance unexpended	25,179.44
July 1, 1907, outstanding liabilities	96.70
July 1, 1907, balance available	25,082.74

APPROPRIATIONS.

July 13, 1892	$18,000
August 19, 1894	13,350
March 3, 1899	5,000
March 2, 1907	25,000
Total	61,350

COMMERCIAL STATISTICS.

Shipping.

	Arrivals.	Departures.
Steam vessels	54	54
Sail vessels	62	62
Total	116	116

Maximum draft, 19.3 feet.

Seventy-nine steam and gasoline vessels, with a total gross tonnage of 845 tons and maximum draft of 11 feet, were engaged in local traffic during the year.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Brick			100	$36,600
Hardware, etc			140	13,440
Lumber and products	115,754	$1,072,872		
Miscellaneous merchandise	34	272	879	87,900
Oysters	170	9,350		
Total	115,958	1,082,494	1,119	137,940

Local traffic.

Articles.	Quantity.	Value.
	Tons.	
Fish and oysters	2,949	$83,529
Flour, feed, etc	370	11,100
Fruit and vegetables	93	2,790
Gravel and sand	5,000	12,000
Machinery	3,005	150,250
Miscellaneous merchandise	110	9,500
Lumber	31	25,000
Total	11,558	294,169

One hundred and seventeen million five hundred and seventeen thousand feet B. M. of saw logs, valued at $918,293 were towed on the Willapa River during the year.

Number of passengers carried, 16,411.

Y Y 2.

IMPROVEMENT OF GRAYS HARBOR AND BAR ENTRANCE, WASHINGTON.

At the south jetty no construction work has been in progress during the year. Property and plant have been cared for by a watchman.

Preliminary surveys for location of approach to jetty on north side, under provisions of the act of March 2, 1907, have been made and action to acquire right of way has been commenced by local interests.

The variation in depth on the bar with the season of the year is very marked. During the summer of 1906 the channel showed a depth of 12 feet; during the past winter it has increased to 24 feet, and it is now about 18 feet. The cause is probably due to changes in the ocean currents and possibly to some extent to the increased water discharge from the harbor in the winter season.

Money statement.

July 1, 1906, balance unexpended		$28,764.21
Amount appropriated by river and harbor act approved March 2, 1907		200,000.00
Received from sales		3.60
		228,767.81
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$1,678.20	
For maintenance of improvement	3,865.25	
		5,543.45
July 1, 1907, balance unexpended		223,224.36
July 1, 1907, outstanding liabilities		350.00
July 1, 1907, balance available		222,874.36
Amount (estimated) required for completion of existing project		400,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907		400,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

June 3, 1896	$20,000.00	March 2, 1907	$200,000.00
June 4, 1897	350,000.00		
March 3, 1899	285,000.00		1,230,000.00
June 6, 1900	50,000.00	Received from sales	3.60
March 3, 1901	138,225.00		
June 28, 1902	156,775.00	Total	1,230,003.60
March 3, 1905	30,000.00		

COMMERCIAL STATISTICS.

Shipping.

	Arrivals.	Departures.
Steam vessels	351	351
Sail vessels	346	346
Total	697	697

Maximum draft, 21 feet.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Brick and stone			5,605	$205,150
Cement			10	200
Clams, canned	150	$12,500		
Coal and iron			4,860	302,800
Flour, feed, etc			25	450
Fruit and vegetables			3,350	100,500
Hides and tallow	280	28,000		
Lumber and products	570,214	5,558,074		
Machinery			800	306,000
Miscellaneous merchandise	800	70,000	11,860	1,152,080
Ore			16,900	5,200
Total	571,444	5,663,574	43,410	2,072,380

Three sawmills, with an aggregate daily capacity of 380,000 feet B. M.; one shingle mill, with daily capacity of 110,000, and one cold-storage plant, with daily capacity of 15 tons of ice, were established during the year.

Y Y 3.

IMPROVEMENT OF GRAYS HARBOR, INNER PORTION, BETWEEN ABERDEEN AND THE ENTRANCE TO SAID HARBOR, AND CHEHALIS RIVER, WASHINGTON.

No operations have been in progress during the year. Under the appropriation of $30,000 by act of March 3, 1905, bids were received August 19, 1905, October 12, 1905, and August 17, 1906, and all rejected as excessive. New proposals are now being advertised for under the above act and an additional appropriation of $177,000 in the river and harbor act of March 2, 1907.

The usual snagging operations in the Chehalis River were carried on.

From such examinations as have been made it is evident that the dredged channels are shoaling rapidly and that the problem of maintenance of these channels is going to be a costly one.

Money statement.

July 1, 1906, balance unexpended	$25,675.96
Amount appropriated by river and harbor act approved March 2, 1907	177,000.00
	202,675.96
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	2,225.79
July 1, 1907, balance unexpended	200,450.17
July 1, 1907, outstanding liabilities	484.50
July 1, 1907, balance available	199,965.67

APPROPRIATIONS.

GRAYS HARBOR, INNER PORTION, BETWEEN ABERDEEN AND THE ENTRANCE TO SAID HARBOR, AND CHEHALIS RIVER, WASHINGTON.

Act of July 13, 1892	$50,000
Act of August 18, 1894	25,000
Act of June 13, 1902	50,000
Act of March 3, 1905	30,000
Act of March 2, 1907	177,000
Total	332,000

IMPROVEMENT OF CHEHALIS RIVER, WASHINGTON.

August 2, 1882	$3,000	June 3, 1896	$3,000
July 5, 1884	2,500	March 3, 1899	3,000
August 5, 1886	2,500		
August 11, 1888	2,000	Total	19,000
September 19, 1890	3,000		

COMMERCIAL STATISTICS.

Local traffic.

	Quantity.	Value.
	Tons.	
Beer	330	$15,665
Coal and coke	129	1,419
Fish	920	28,175
Flour, feed, etc	358	8,608
Fruit and vegetables	282	8,460
Iron and steel	223	8,920
Lumber	110	10,995
Machinery	200	16,000
Miscellaneous merchandise	9,015	675,332
Total	11,567	773 574

Five hundred and fifty-three million nine hundred and four thousand five hundred and eighty-two feet B. M. of saw logs, valued at $5,081,317, were towed to the mills on Grays Harbor during the year.

Seventy-two steam and gasoline vessels, with an aggregate gross tonnage of 1,260 tons and maximum draft of 12 feet, were engaged in local traffic on the river and inner harbor during the year.

Number of passengers carried, 107,389.

Y Y 4.

IMPROVEMENT OF PUGET SOUND AND ITS TRIBUTARY WATERS, WASHINGTON.

The following work was done by the snag boat during the year:

Snags and other obstructions disposed of in—	
Skagit River and tributaries	1,321
Snohomish River and tributaries	512
Stilaguamish River	230
Puyallup River	597
Nooksak River	110
Swinomish Slough	6
Oak Harbor	1
Total	2,777

Total length of snags, 58,084 feet; largest diameter, 18 feet; smallest diameter, 6 inches.

There are no other matters to report other than those contained in the summary of the Chief of Engineers.

Money statement.

GENERAL IMPROVEMENT.

July 1, 1906, balance unexpended	$3,648.30
Amount appropriated by river and harbor act approved March 2, 1907	75,000.00
Received from sales	160.15
	78,808.45
June 30, 1907, amount expended during fiscal year, for works of improvement	5,369.52
July 1, 1907, balance unexpended	73,438.93
July 1, 1907, outstanding liabilities	4,000.07
July 1, 1907, balance available	69,438.86
Amount (estimated) required for completion of existing project	Indefinite.
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907 — Submitted in compliance with requirements of sundry civil act of June 4, 1897.	125,000.00

EMERGENCIES IN RIVERS AND HARBORS.

Amount allotted during year	$4,500.00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	4,133.18
July 1, 1907, balance unexpended	366.82
July 1, 1907, outstanding liabilities	366.82

APPROPRIATIONS.

June 14, 1880	$2,500	March 3, 1899	$20,000
August 2, 1882	20,000	June 13, 1902	35,000
July 5, 1884	10,000	April 28, 1904 (allotment)	12,000
August 5, 1886	10,000	March 3, 1905	20,000
August 11, 1888	15,000	March 3, 1905 (allotment)	4,500
September 19, 1890	12,000	March 2, 1907	75,000
July 13, 1892	15,000		
August 18, 1894	14,000	Total	340,000
June 3, 1896	75,000		

COMMERCIAL STATISTICS.

SKAGIT RIVER.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Agricultural implements			65	$14,200
Dairy products	158	$35,600	2	760
Eggs	42	10,500		
Flour			439	21,960
Fish, fresh	1,143	39,130	3	520
Fruit and vegetables	993	29,233	96	6,000
Grain	8,829	220,725	1,077	32,310
Hardware and building material			474	51,100
Hay	6,000	69,000		
Hides	72	14,672		
Live stock	168	17,970	85	18,940
Lumber			91	192
Machinery			24	4,760
Miscellaneous merchandise	515	51,432	4,344	384,780
Wagons	6	240	42	9,200
Total	17,926	488,502	6,742	544,722

Fifty-nine million three hundred and sixty thousand feet B. M. of saw logs, 32,000 linear feet of piling, 64,160 cords of shingle bolts, and 1,300 cords of wood were floated down the river and towed to the mills during the year. Total value, $733,228.

Eight steamers, with an aggregate gross tonnage of 1,743 tons and maximum draft of 5 feet, and 16 launches, with an aggregate gross tonnage of 138 tons and maximum draft of 4 feet, were engaged in traffic on the river during the year.

The following new industries, whose product will be handled by water, were established on the river during the year:

Two milk condensers, with a capacity of 170 tons per day.

Ono fruit cannery, with a capacity of 15 tons per day.

Six logging camps, with an annual capacity of 70,000,000 feet of logs.

One saw and shingle mill, with an annual capacity of 10,000,000 feet of lumber and using 7,000 cords of shingle bolts.

SNOHOMISH RIVER.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Grain	2,000	$50,000	200	$5,000
Hay	600	7,200	200	2,000
Salmon	480	29,040		
Lime			4,800	6,550
Machinery	144	14,400	345	4,000
Miscellaneous merchandise			24,492	69,036
Lumber and products	26,346	245,659		
Total	29,570	346,299	30,037	86,586

Two hundred and forty-four million feet B. M. of saw logs, 723,154 linear feet of poles and piling, and 1,000 cords of shingle bolts were floated down the river and towed to the mills during the year. Total value, $2,724,240.

Two sawmills, two shingle mills, and one turpentine plant were established on the river during the year.

Four vessels, with an aggregate gross tonnage of 700 tons and maximum draft of 4 feet, were engaged in traffic on the river above Everett; and about 20 tugs were engaged in towing logs from and into the river during the year.

STILAGUAMISH RIVER.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Agricultural implements			33	$7,100
Dairy products			2	875
Eggs	14	$3,500		
Fish	89	17,800		
Flour			146	7,320
Fruit and vegetables	135	3,475	143	3,686
Grain	3,000	75,000	412	12,300
Hardware and building material			157	17,535
Hay	605	7,260		
Hides	31	4,890		
Live stock	49	5,970	32	5,680
Lumber	240	2,700		
Machinery			30	5,200
Miscellaneous merchandise	172	14,030	1,728	147,290
Wagons	8	718	36	2,900
Total	4,343	135,343	2,719	209,886

Forty-four million feet B. M. of saw logs, 20,300 cords of shingle bolts, and 45,200 linear feet of poles and piling were floated down this river during the year. Total value, $456,058.

Four steam vessels and four launches, with an aggregate gross tonnage of 903 tons and maximum draft of 5 feet, were engaged in traffic on the river during the year.

NOOKSACK RIVER.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Agricultural implements			2	$168
Farm produce	259	$6,145	¼	85
Flour			22	890
Fish	37	4,437		
Miscellaneous merchandise	1	75	127	13,075
Total	297	10,657	151¼	14,218

Four million feet B. M. of lumber, 23,500 cords of shingle bolts, and 1,320 linear feet of piling were towed and floated down the river during the year. Total value, $107,479.

One steam vessel of 133 tons and maximum draft of 3½ feet and several small launches were engaged in traffic on the river during the year.

DUWAMISH RIVER.

Local traffic.

Articles.	Quantity.	Value.
	Tons.	
Brick	31,860	$110,952
Coal	6,800	9,700
Fish	206	1,346
Hay, feed, etc	280	5,195
Lumber	625	5,004
Miscellaneous merchandise	66	2,300
Sand and gravel	35,575	27,417
Total	75,412	161,914

Thirteen and one-half million feet B. M. of saw logs and 475,140 linear feet of poles and piling were towed on the river during the year. Total value, $144,790.

The water traffic is carried on by small tugs and launches towing barges.

Y Y 5.

INSPECTION OF FISH TRAPS, ETC., PUGET SOUND, WASHINGTON.

For inspection of fish traps in Puget Sound a tug has been hired, as follows, during the year:

July 1 to August 31, 1906.

All traps have been periodically inspected during construction, while in operation, and during removal to insure that the traps were built according to approved plans, that proper lights and fog signals were maintained on them, and that broken-off or submerged piles were not left where dangerous to navigation in removing the traps.

Money statement.

July 1, 1906, balance unexpended	$4,900.57
Amount allotted during year	6,000.00
	10,900.57
June 30, 1907, amount expended during fiscal year, for works of improvement	3,655.47
July 1, 1907, balance unexpended	7,245.10
July 1, 1907, outstanding liabilities	290.00
July 1, 1907, balance available	6,955.10
July 1, 1907, amount covered by uncompleted contracts	4,500.00
Amount (estimated) required for completion of existing project	Indefinite.

CONTRACT IN FORCE.

CONSTRUCTION OF LAUNCH.

On May 29, 1907, a contract was let for the construction of a launch to be used for inspection purposes on the sound. Length, 63 feet; beam, 11 feet 6 inches; driven by a 50-horsepower Ralaco gasoline engine.

Contractor: James W. Hall.
Date of contract: May 29, 1907.
Date of commencement: June 5, 1907.
Date of completion: September 5, 1907.

ALLOTMENTS.

February 13, 1904	$4,000
August 4, 1904	2,000
December 15, 1904	2,000
April 17, 1905	5,000
February 28, 1906	6,000
February 23, 1907	6,000
Total	25,000

Y Y 6.

IMPROVEMENT OF HARBOR AT OLYMPIA, WASHINGTON.

There were no operations during the past fiscal year except general care of the work, inspections, and compilation of commercial statistics.

The work was under the general supervision of Mr. Eugene Ricksecker, assistant engineer.

Money statement.

July 1, 1906, balance unexpended	$7,282.37
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	4.94
July 1, 1907, balance unexpended	7,277.43
July 1, 1907, outstanding liabilities	6.44
July 1, 1907, balance available	7,270.99

APPROPRIATIONS.

July 13, 1892	$35,000
August 18, 1894	40,000
June 3, 1896	32,000
March 3, 1899	15,000
June 13, 1902	25,000
Total	147,000

COMMERCIAL STATISTICS.

Shipping.

[Except local traffic.]

	Steam vessels.	Sail vessels.	Total gross tonnage.
Arrivals	13	23	36,336
Departures	13	23	36,336

Maximum draft, 25 feet.

Local traffic.

Six steam vessels, maximum draft 8½ feet, were engaged in local traffic and made 2,032 trips during the year.

The total tonnage of the port was 884,318 tons.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Beer	2,035	$128,432	.....	.....
Dairy and farm products	556	104,885	1,045	$47,000
Four, feed, and groceries	937	59,430	2,905	163,663
Fish, oysters, etc	353	21,010	2,670	193,500
Grain	250	10,400	.....	.....
Hay	100	1,660	.....	.....
Lumber and products	50,424	393,107	.....	.....
Machinery	250	25,000	605	59,150
Miscellaneous merchandise	2,418	209,797	13,953	854,839
Live stock	300	25,400	330	32,300
Piles	793	2,860	.....	.....
Wooden pipe	2,080	29,000	.....	.....
Wool	20	2,000	.....	.....
Total	60,516	1,012,981	21,508	1,350,452

One hundred and nine million feet B. M. of saw logs, 1,000 cords of shingle bolts, 32,250 linear feet of piling, and 1,025 cords of wood were towed to and from the harbor during the year. Total value, $1,049,384.

Y Y 7.

IMPROVEMENT OF TACOMA HARBOR, WASHINGTON.

There have been no operations during the year except preparations for work of dredging the Puyallup waterway. The conditions imposed by the act of March 3, 1905, have been complied with, and specifications for the work have been prepared.

The work was in charge of Mr. Eugene Rickseckcr, assistant engineer, during the year.

Money statement.

July 1, 1906, balance unexpended	$221,136.12
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	4,324.21
July 1, 1907, balance unexpended	216,811.91
July 1, 1907, outstanding liabilities	733.50
July 1, 1907, balance available	216,078.41
Amount (estimated) required for completion of existing project	40,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897.	40,000.00

APPROPRIATIONS.

CITY WATERWAY.

June 13, 1902	$75,000
March 3, 1903	100,000
Total	175,000

PUYALLUP WATERWAY.

March 3, 1905	$40,000
June 30, 1906	160,000
Total	200,000

COMMERCIAL STATISTICS.

Shipping.

[Except local traffic.]

	Steam vessels.	Sail vessels.	Total gross tonnage.
Arrivals	1,473	242	1,836,555
Departures	1,457	219	1,794,322

Maximum draft, 32.8 feet.

Local traffic.

Twenty-one steamers, maximum draft 15 feet, were engaged in local traffic during the year. These vessels made 5,935 trips.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Agricultural implements	391	$156,400	2	$800
Beer	728	46,592		
Brick			4,076	28,042
Cable and wire	793	635,950		
Cement	8,821	132,309	11,233	167,570
Coal	893	3,447	258	1,548
Copper	4,900	1,942,495	38	12,956
Cotton	7,211	1,586,420		
Fish, fresh and canned	2,113	228,030	7,269	683,620
Flour	106,514	3,986,650		
Fruit and vegetables	265	12,440	2,461	104,620
Grain	14,860	352,331	3,558	85,660
Gunnies	316	47,400	5,231	784,650
Hay	2,125	27,304	751	11,061
Hardware and building material	2,942	238,940	1,763	211,560
Iron and steel	698	85,820	544	45,498
Lime and limestone			30,858	155,133
Live stock	1,496	131,350	136	20,400
Lumber and products	288,387	3,093,768	45,080	274,771
Machinery	1,351	331,550	142	35,500
Matting	16	3,520	9,695	2,132,900
Miscellaneous merchandise	74,530	6,458,079	90,203	5,685,035
Ore	480	4,120	95,525	2,525,598
Products of packing house	4,992	703,860	41	7,640
Products of smelter	8,955	2,919,400	7,134	1,504,028
Rice	372	37,200	2,617	261,700
Sand and gravel			62,898	39,353
Sugar	212	21,200	8,174	817,400
Silk			115	690,000
Sheeting	1,966	983,000		
Tea	136	34,000	3,706	1,853,000
Tin	108	3,780	49	41,650
Wines and liquors	552	220,800	1,655	662,000
Tobacco	541	119,020	79	20,160
Wheat	187,115	4,847,355		
Total	724,779	29,394,530	395,291	18,858,853

Three hundred and twenty million feet B. M. of saw logs and 32,000 linear feet of piling were towed to and from the harbor during the year. Total value, $3,320,139.

Y Y 8.

IMPROVEMENT OF WATERWAY CONNECTING PUGET SOUND WITH LAKES UNION AND WASHINGTON.

The work of dredging in Ballard Harbor under the act of June 13, 1905, was completed October 31, 1906. The total quantity of material removed under the appropriation was 340,000 cubic yards.

Work is now in progress on the survey and estimate for a canal required by the act of March 2, 1907.

Rules and regulations have been prepared and submitted to the Secretary of War for approval governing logging operations in the Sammamish River and in the channel connecting Lakes Union and Washington.

Money statement.

July 1, 1906, balance unexpended		$65,978.94
Amount appropriated by river and harbor act, approved March 2, 1907		10,000.00
		75,978.94
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$64,830.06	
For maintenance of improvement	2,118.00	
		66,948.06
July 1, 1907, balance unexpended		9,030.88
July 1, 1907, outstanding liabilities		1,053.60
July 1, 1907, balance available		7,977.28
Amount (estimated) required for completion of existing project		Indefinite.
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907		10,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

APPROPRIATIONS.

August 18, 1894	$25,000
June 3, 1896	150,000
June 13, 1902	160,000
March 3, 1905	125,000
March 2, 1907	10,000
Total	470,000

CONTRACT IN FORCE.

Contractor: Puget Sound Bridge and Dredging Company.
Date of contract: August 23, 1905.
Date of approval: September 12, 1905.
Date of commencement: November 17, 1905.
Date of completion: July 19, 1906.
Date of completion: Extended to December 1, 1906.
Contract completed: October 31, 1906.

COMMERCIAL STATISTICS.

Shipping.

INNER SALMON BAY—BALLARD.

	Arrivals and departures.	Gross tonnage.
Sail vessels	35	23,690

Shipping—Continued.

OUTER SALMON BAY.

Steam vessels	5	21,500
Sail vessels	5	7,138
Total	10	28,638

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Lumber and products	37,953	$353,300		
Logs			263,823	$1,325,303
Miscellaneous merchandise	776	25,289	8,980	31,223
Total	38,729	378,589	272,803	1,356,526

LAKES UNION AND WASHINGTON.

Local traffic.

Articles.	Quantity.	Value.
	Tons.	
Agricultural implements	11	$3,300
Brick	114	210
Coal	10,360	27,390
Dairy and farm products	951	90,228
Hay and grain	2,597	47,772
Hardware and building material	507	33,537
Live stock	849	81,200
Lumber and products	18,277	288,159
Logs, shingle bolts, and piles	358,139	1,638,319
Machinery	165	8,930
Miscellaneous merchandise	939	37,350
Wood	1,400	1,900
Total	394,309	2,258,295

Fourteen steamers with an aggregate gross tonnage of 1,086 tons were engaged in traffic on the lakes during the year.

Number of passengers carried, 500,373.

Y Y 9.

IMPROVEMENT OF HARBOR AT EVERETT, WASHINGTON.

No work was done during the year.

Expenditures during the year were for inspection of dredging done under private contracts and for inspections of existing works and examinations in connection with complaints in regard to obstructions to navigation.

Money statement.

July 1, 1906, balance unexpended	$8,236.42
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	491.05
July 1, 1907, balance unexpended	7,745.37

APPROPRIATIONS.

August 18, 1895	$10,000	March 3, 1901	$90,000
June 3, 1896	20,000	June 28, 1902	117,000
March 3, 1899	50,000		
June 6, 1900	135,000	Total	422,000

COMMERCIAL STATISTICS.

Shipping.

	Arrivals and departures.	Total gross tonnage.
Steam vessels	94	34,928
Sail vessels	125	162,500

Maximum draft, 30 feet.

Twenty-three steam vessels, with an aggregate gross tonnage of 4,000 tons, maximum draft of 18 feet, were engaged in local traffic.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Lumber and products	106,500	$1,065,000		
Flour	7,500	225,000		
Lime rock			10,000	$15,000
Miscellaneous merchandise	4,666	298,200	8,190	533,900
Ore			10,800	860,000
Paper	4,047	323,760		
Pig lead and metal	7,500	500,000		
Total	130,213	2,411,960	28,990	1,408,900

Y Y 10.

IMPROVEMENT OF SWINOMISH SLOUGH, WASHINGTON.

There have been no operations during the year except those of preparation during the past two months for carrying out the work outlined by the river and harbor act of March 2, 1907.

Money statement.

July 1, 1906, balance unexpended		$770.21
Amount appropriated by river and harbor act approved March 2, 1907		75,000.00
		75,770.21
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$2,045.45	
For maintenance of improvement	770.21	
		2,815.66
July 1, 1907, balance unexpended		72,954.55
July 1, 1907, outstanding liabilities		3,539.95
July 1, 1907, balance available		69,414.60

APPROPRIATIONS.

July 13, 1892	$25,000
August 18, 1894	25,000
June 3, 1896	25,000
March 3, 1899	20,000
June 13, 1902	30,000
March 3, 1905	5,000
March 2, 1907	75,000
Total	205,000

COMMERCIAL STATISTICS.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Agricultural implements			205	$16,500
Fish	1,628	$52,769		
Grain	25,000	650,000	275	5,675
Gravel			490	490
Hay	16,000	184,000		
Hops	20	4,800		
Live stock	55	2,200	128	25,600
Lumber and products	1,350	13,500	40	2,400
Miscellaneous merchandise	771	103,837	4,799	425,111
Wood			2,500	7,500
Total	44,824	1,011,106	8,437	483,276

Twenty and one-half million feet B. M. of saw logs, valued at $226,500, were towed through Swinomish Slough during the year.

Eleven vessels, with an aggregate gross tonnage of 1,962 tons and a maximum draft of 6.7 feet, were engaged in traffic on Swinomish Slough.

Y Y 11.

IMPROVEMENT OF NEW WHATCOM HARBOR, WASHINGTON.

There have been no operations during the past fiscal year.

Money statement.

July 1, 1906, balance unexpended	$2,495.00
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	168.98
July 1, 1907, balance unexpended	2,326.02

APPROPRIATIONS.

June 13, 1902	$25,000
March 3, 1905	35,000
Total	60,000

COMMERCIAL STATISTICS.

Shipping.

[Except local traffic.]

	Arrivals and departures.	Total gross tonnage.
Steam vessels	156	46,233
Sail vessels	70	59,886
Total	226	106,119

Maximum draft, 33.4 feet.

Fourteen steam vessels, with an aggregate gross tonnage of 3,885 and maximum draft of 13.7 feet, were engaged in local traffic, and made 2,392 trips during the year.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Agricultural implements	23	$3,610	8	$1,240
Coal	520	2,140	5,464	23,500
Fish	292	22,540	50	4,075
Flour and grain	185	5,700	719	21,085
Fruit and vegetables	280	10,300	685	26,400
Hay	200	2,880	880	12,160
Hardware and building material	789	82,280	1,872	194,602
Lumber and products	233,328	1,902,687	2,441	55,840
Live stock	155	21,700	250	35,000
Machinery	445	58,029	65	15,924
Miscellaneous merchandise	6,875	628,726	18,048	1,424,726
Salmon:				
Fresh	255	39,600	6,556	260,174
Canned	920	220,800	1,250	300,000
Tin cans	9,000	181,000	907	19,186
Wool	110	57,200	20	10,400
Total	253,377	3,239,192	39,215	2,404,312

Two hundred and thirty-four million feet B. M. of saw logs, valued at $2,477,869, were towed to the mills at Bellingham during the year.

Y Y 12.

IMPROVEMENT OF COLUMBIA RIVER, BETWEEN WENATCHEE AND BRIDGEPORT, WASHINGTON.

There were no operations during the past fiscal year.

Money statement.

Amount appropriated by river and harbor act approved March 2, 1907	$42,000.00
July 1, 1907, balance unexpended	42,000.00

APPROPRIATION.

Act of March 2, 1907	$42,000

COMMERCIAL STATISTICS.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Agricultural implements and machinery			441	$88,200
Flour, wheat, and oats	37,518	$937,950		
Fruit			1,624	138,610
Lumber and products			755	15,100
Miscellaneous merchandise	887	451,000	12,035	2,270,500
Total	38,405	1,388,950	14,855	2,512,410

Five steam vessels, with an aggregate gross tonnage of 1,433 tons and maximum draft of 5½ feet, were engaged in traffic on the river during the year.

Number of passengers carried, 21,964.

Y Y 13.

IMPROVEMENT OF OKANOGAN AND PEND OREILLE RIVERS, WASHINGTON.

(A) OKANOGAN.

The operations of the past fiscal year are described in the following extract from the report of Mr. C. E. Hansen, overseer in charge.

The work consisted of dam construction and the removal of bowlders from the channel of the following rapids:

Kahlow Rapids, or rapid No. 12.

One hundred and forty-eight tons of bowlders were taken from Kahlow Rapids, resulting in straightening the lower end of the rapid.

The dam closing the right channel at island below Kahlow Rapids was thoroughly repaired and strengthened; 158 tons of bowlders and 173 tons of gravel were used for repairs.

A new wing dam 90 feet long, 2 feet high, and 20 feet wide was constructed below dam at the island. One hundred and fifty-one brush fascines, 24 tons bowlders, and 117 tons gravel were used in the construction.

Rapid No. 13 was deepened and widened by the removal of 93 tons of bowlders.

Guthrie Rapids: Seven hundred and thirty tons of bowlders were removed from this place, resulting in a general widening and straightening of the channel.

Chilowhist Rapids: One hundred and twenty-four tons of bowlders were taken from the channel. A wing dam 110 feet long, 6 feet wide at base, and 2 feet high was constructed at this place, mostly from the bowlders taken out of the channel. This resulted in an increased depth of water here.

A large number of bowlders and snags were removed from the stretches between the rapids; cables were laid as an aid to steamers in ascending in the riffle below the dam, the Guthrie Rapids, and the Chilowhist Rapids.

Money statement.

July 1, 1906, balance unexpended	$889.12
Amount appropriated by river and harbor act approved March 2, 1907	5,000.00
Transferred from Pend Oreille River	1,994.58
	7,883.70
June 30, 1907, amount expended during fiscal year, for maintenance of improvement	3,826.91
July 1, 1907, balance unexpended	4,056.79
July 1, 1907, outstanding liabilities	25.00
July 1, 1907, balance available	4,031.79

(B) PEND OREILLE RIVER.

There were no operations during the past fiscal year.

Money statement.

July 1, 1906, balance unexpended	$6,048.24
Amount appropriated by river and harbor act approved March 2, 1907	15,000.00
	21,048.24
Transferred to Okanogan River	1,994.58
	19,053.66
June 30, 1097, amount expended during fiscal year, for maintenance of improvement	232.97
July 1, 1907, balance unexpended	18,820.69
July 1, 1907, outstanding liabilities	125.00
July 1, 1907, balance available	18,695.69

APPROPRIATIONS.

March 3, 1899	$25,000
June 13, 1902	22,500
March 3, 1905	15,000
March 2, 1907	20,000
Total	82,500

COMMERCIAL STATISTICS.

OKANOGAN RIVER.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Agricultural implements and machinery			208	$31,200
Flour			268	13,400
Lumber and products			100	8,500
Miscellaneous merchandise	14	$3,300	785	151,980
Ore	5	500		
Wool	80	35,000		
Wheat	500	10,000		
Total	599	48,800	1,361	205,080

Five steamers with an aggregate gross tonnage of 1,433 tons and maximum draft of 5 feet were engaged in traffic on the river during the year.

PEND OREILLE RIVER.

Exports and imports.

Articles.	Exports.		Imports.	
	Quantity.	Value.	Quantity.	Value.
	Tons.		*Tons.*	
Agricultural implements			11	$1,100
Flour and grain			480	21,600
Hay	96	$1,920	157	3,140
Hardware and building material			137	101,360
Lumber and products	31,637	315,624		
Machinery			34	3,400
Miscellaneous merchandise	36	4,610	355	49,080
Total	31,769	322,154	1,174	179,680

Two steamers with an aggregate gross tonnage of 419 tons and maximum draft of 4 feet, and two tugs towing barges were engaged in traffic on the river during the year.

APPENDIX Z Z.

RIVER AND HARBOR IMPROVEMENTS IN ALASKA.

REPORT OF CAPT. G. B. PILLSBURY, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. St. Michael Canal, Alaska.
2. Removing sunken vessels or craft obstructing or endangering navigation.

UNITED STATES ENGINEER OFFICE,
Skagway, Alaska, June 3, 1907.

GENERAL: I have the honor to submit herewith * * * reports of the operations of the U. S. Engineer Office at Skagway for the fiscal year 1907.

On account of my approaching departure for the interior of Alaska it has been necessary to submit these reports at this date in order to reach Washington by July 10.

Very respectfully,

G. B. PILLSBURY,
Captain, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

Z Z 1.

IMPROVEMENT OF ST. MICHAEL CANAL, ALASKA.

Operations during the year consisted in the preparation of specifications and the advertisement for proposals for work.

Money statement.

Amount appropriated by river and harbor act approved March 2, 1907	$98,000.00
July 1, 1907, outstanding liabilities	32.50
July 1, 1907, balance available	97,967.50
Amount (estimated) required for completion of existing project	150,000.00
Amount that can be profitably expended in the fiscal year 1909, for work of improvement, in addition to the balance unexpended July 1, 1907	150,000.00

Submitted in compliance with the requirements of the sundry civil act of June 4, 1897.

APPROPRIATION.

March 2, 1907 ..... $98,000

COMMERCIAL STATISTICS.

As the port of St. Michael is closed until about the middle of June, it has been impossible to obtain a statement of the commercial statistics for the past fiscal year.

Z Z 2.

REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

WRECK OF STEAMER ROCK ISLAND.

The steamer *Rock Island* was sunk in the Tanana River in front of the town of Chena, Alaska, during the break up of the ice in the spring of 1906. The wreck being an obstruction to navigation, and being apparently abandoned, proposals have been asked for by circular letter for the removal of the wreck, under authority of the Chief of Engineers of May 1, 1907.

APPENDIX A A A.

RIVER AND HARBOR IMPROVEMENTS IN THE TERRITORY OF HAWAII.

REPORT OF CAPT. C. W. OTWELL, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. Honolulu Harbor, Hawaii.
2. Reclamation of Quarantine Island, Honolulu, Hawaii.
3. Hilo Harbor, Hawaii.

UNITED STATES ENGINEER OFFICE,
Honolulu, Hawaii, July 1, 1907.

GENERAL: I have the honor to submit herewith annual report upon the works of improvement under my charge for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

C. W. OTWELL,
Captain, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

A A A 1.

IMPROVEMENT OF HONOLULU HARBOR, HAWAII.

For history and description of the work done at this locality, see page 803 of this report and page 787 of the Annual Report of the Chief of Engineers for 1906.

A continuing contract was approved September 12, 1905, for dredging in sections A and B, and under it dredging was commenced November 3, 1905, and completed July 31, 1906, 1,422,146 cubic yards of material having been removed. Fifty-eight thousand seven hundred and fifty-five cubic yards of material were also removed from section C by the same contractor, under an open-market agreement, approved by the Chief of Engineers July 23, 1906.

It is proposed to apply the balance available from the previous appropriations and additional funds appropriated under the river and harbor act of March 2, 1907, to continuing the work of dredging section B and such portion of section C as funds permit. The reclamation of Sand Island will be continued and a small portion of private lands (belonging to the Dowsett Company (Limited)) omitted under previous work will also be reclaimed. The additional appro-

priation asked for will be used in continuing the work projected in section C.

Money statement.

July 1, 1906, balance unexpended	$206,900.19
Proceeds of sale of blueprints	8.00
Amount appropriated by river and harbor act approved March 2, 1907	200,000.00
	406,908.19
June 30, 1907, amount expended during fiscal year, for works of improvement	169,378.79
July 1, 1907, balance unexpended	237,529.40
July 1, 1907, outstanding liabilities	351.32
July 1, 1907, balance available	237,178.08
Amount (estimated) required for completion of existing project	982,832.67
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement in addition to the balance unexpended July 1, 1907	500,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATIONS.

March 3, 1905	$200,000
June 30, 1906	200,000
March 2, 1907	200,000
	600,000
Receipts from sales	8

CONTRACT IN FORCE.

Contractor: San Francisco Bridge Company, San Francisco, Cal.

Character of work: Dredging.

Rate: $0.2487 per cubic yard, measured in place, above the depth of 35 feet below mean low water; $0.12435 per cubic yard, measured in place, between the depths of 35 and 36 feet below mean low water.

Date of approval: September 12, 1905.

Date of beginning work: November 3, 1905.

Date of completion: July 31, 1906.

COMMERCIAL STATISTICS.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1906, FOR THE PORT OF HONOLULU, HAWAII.

[Furnished by the collector of customs of the port of Honolulu.]

Number and tonnage of vessels entering and clearing during the year.

	Steam vessels.	Sailing vessels.	Total.	Total tonnage.
Entered	223	152	385	986,590
Cleared	240	145	385	981,247
Total	473	297	770	1,967,837

Duties on imports collected	$1,282,394.94
All moneys collected at custom-house	1,368,047.79

Commerce between Honolulu and the United States and foreign ports during calendar year 1906.

Class.	Quantity.	Value.
RECEIPTS.		
From foreign countries:	*Tons.*	
Food supplies		$916,682
Coal	125,542	280,089
Spirits		284,799
Fertilizer		57,736
Cement	7,533	67,418
Chemicals		1,059,315
Iron and steel		53,326
Miscellaneous		1,024,804
Total	133,075	3,744,169
From the United States to the district of Hawaii:		
Food supplies		2,511,326
Spirits		585,261
Chemicals		540,585
Iron and steel		1,425,345
Cottons		1,057,538
Miscellaneous		6,510,900
Total district of Hawaii		12,630,955
Total subports		2,873,912
Total Honolulu		9,757,043
SHIPMENTS.		
To the United States and foreign countries:		
Sugar	221,075	14,921,031
Fruits		373,871
Coffee	1,022	242,398
Hides and skins	578	132,213
Miscellaneous		638,015
Total	222,675	16,307,528

The commerce of the port of Honolulu for the past calendar year was valued at $29,808,740 and amounted to more than 355,750 tons.

Passengers arrived and departed from Honolulu during calendar year 1906:

Passengers, not immigrants, arrived	1,063
Passengers, immigrants, arrived from foreign countries	18,703
Passengers departed for foreign countries	4,948

LOCAL COMMERCE.

[Between Honolulu and island ports.]

This commerce to a great extent is the distribution and collection of the commerce set forth in the above lists. From statement furnished by the Inter-Island Steam Navigation Company (Limited), this commerce during the past calendar year was as follows:

Freight (sugar and miscellaneous articles)	tons	303,830
Passengers		57,463

In addition to the commerce actually received at and shipped from this port, all that commerce between the United States, the Orient, and Australia carried by ships calling at this port is directly and equally benefited by this improvement, safer and speedier entrance and exit being afforded the ships carrying it.

A A A 2.

RECLAMATION OF QUARANTINE ISLAND, HONOLULU, HAWAII.

For history and projects, see page 804 of this report, and page 789 of the Annual Report of the Chief of Engineers for 1906.

One hundred and fifty-eight thousand two hundred and fourteen cubic yards of material were placed on the island under emergency contract. The island is still below grade, and a modified project approved June 17, 1907, provides for bringing the low places to grade by means of a hoisting engine and scraper, fill being obtained from material lying on the coral reef in front of the sea wall. Work under this project was begun June 18, 1907, and has consisted of assembling the plant and removal of about 200 cubic yards of material. It is proposed to apply the balance available to completing the work under the modified project.

Money statement.

July 1, 1906, balance unexpended	$19,754.35
June 30, 1907, amount expended during fiscal year, for works of improvement	16,125.81
July 1, 1907, balance unexpended	3,628.54
July 1, 1907, outstanding liabilities	496.40
July 1, 1907, balance available	3,132.14

APPROPRIATION.

February 27, 1906	$20,000

CONTRACT IN FORCE.

Contractor: San Francisco Bridge Company, San Francisco, Cal.
Character of work: Reclaiming Quarantine Island by pumping the material dredged from Honolulu Harbor to fill the same.
Rate: 10 cents per cubic yard.
Date of approval: (Emergency contract.)
Date of beginning work: May 21, 1906.
Date of completion: August 6, 1906.

COMMERCIAL STATISTICS.

For commercial statistics, see report for Improving Honolulu Harbor, Hawaii.

A A A 3.

IMPROVEMENT OF HILO HARBOR, HAWAII.

For history and project of this work, see current summary, page 805.

No work was done on this improvement during the past fiscal year.

Money statement.

Amount appropriated by river and harbor act approved March 2, 1907	$200,000.00
July 1, 1907, balance unexpended	200,000.00
Amount (estimated) required for completion of existing project	1,500,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907. Submitted in compliance with requirements of sundry civil act of June 4, 1897.	600,000.00

APPROPRIATION.

March 2, 1907 ..... $200,000

COMMERCIAL STATISTICS.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING JANUARY 31, 1906, FOR THE PORT OF HILO, HAWAII.

[Furnished by the collector of customs.]

Number and tonnage of vessels entering and clearing during the year.

	Steam vessels.	Sailing vessels.	Total.	Total tonnage.
Entered	40	32	72	138,118
Cleared	36	34	70	130,621
Total	76	66	142	268,739

Duties on imports collected	$0.67
All money collected at custom-house	168.60

Commerce between Hilo and the United States and foreign ports during calendar year 1906.

Class.	Quantity.	Value.
Shipments to the United States and foreign countries:	*Tons.*	
Sugar	78,498	$5,018,788
Fruits		14,267
Miscellaneous		112,749
Total		5,145,804
Receipts from the United States, miscellaneous		1,477,650
Total		6,623,454

APPENDIX B B B.

RIVER AND HARBOR IMPROVEMENTS IN PORTO RICO.

REPORT OF MAJ. CHAS. L. POTTER, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

IMPROVEMENTS.

1. San Juan Harbor, Porto Rico.
2. Removing sunken vessels or craft obstructing or endangering navigation.

UNITED STATES ENGINEER OFFICE,
Tompkinsville, N. Y., July 1, 1907.

GENERAL: I have the honor to forward herewith annual reports upon works of river and harbor improvements under my charge in Porto Rico for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

CHAS. L. POTTER,
Major, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

B B B 1.

IMPROVEMENT OF HARBOR AT SAN JUAN, PORTO RICO.

This is entirely a new work. No work has been done other than to establish an office and prepare and submit specifications for the work.

Money statement.

Amount appropriated by river and harbor act approved March 2, 1907	$157,500.00
June 30, 1907, amount expended during fiscal year, for works of improvement	979.97
July 1, 1907, balance unexpended	156,520.03
July 1, 1907, outstanding liabilities	350.00
July 1, 1907, balance available	156,170.03
Amount (estimated) required for completion of existing project	600,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	300,000.00

Submitted in compliance with requirements of sundry civil act of June 4, 1897.

APPROPRIATION.

March 2, 1907 ..... $157,500

B B B 2.

REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION.

Wreck of the tugboat Mayaguez in the harbor of Ponce, P. R.—This is the wreck of a small tugboat, and lies in a position to interfere with the navigation of the harbor for small craft.

An examination of the wreck was made in the latter part of May, and $500 have been allotted for its removal. Notice has been given the owner that he must remove the wreck, if he desires to do so, within thirty days from June 4, 1907.

APPENDIX C C C.

ANNUAL REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., July 8, 1907.

GENERAL: The Board of Engineers for Rivers and Harbors has the honor to submit the following report of its operations during the fiscal year ending June 30, 1907. Information concerning the organization of the Board and its duties, as prescribed by the act approved June 13, 1902, was contained in the Board's annual report for the fiscal year ending June 30, 1904 (p. 3671), and is therefore not repeated herein.

In its last annual report the membership of the Board on June 30, 1906, was recorded as follows: Col. D. W. Lockwood, Lieut. Col. R. L. Hoxie, Maj. C. McD. Townsend, Maj. W. C. Langfitt, and Capt. Charles W. Kutz.

Since June 30, 1906, the following changes have occurred in the personnel of the Board:

August 3, 1906, by Special Orders, No. 23, Office of the Chief of Engineers, Maj. E. Eveleth Winslow was detailed temporarily as a member of the Board, vice Maj. W. C. Langfitt, who was temporarily relieved by the same orders.

December 8, 1906, by Special Orders, No. 39, Office of the Chief of Engineers, Major Townsend was relieved from temporary detail as a member of the Board. By the same orders Maj. Chester Harding and Capt. William J. Barden were detailed as members of the Board, vice Maj. W. C. Langfitt and Capt. Charles W. Kutz, thereby relieved.

The following changes in the personnel of the Board were ordered for the consideration only of the report on the improvement of the Ohio River, submitted by a Board of Engineers constituted by Special Orders, Nos. 17, Office of the Chief of Engineers, May 12, 1905:

January 2, 1907, Maj. C. McD. Townsend was detailed temporarily as a member of the Board, relieving Col. D. W. Lockwood for such period.

January 8, 1907, Col. H. M. Adams was detailed temporarily as a member of the Board, relieving Maj. Chester Harding for such period.

January 8, 1907, Col. Chas. E. L. B. Davis was detailed temporarily as a member of the Board, relieving Capt. William J. Barden for such period.

On June 30, 1907, the Board was constituted as follows for the performance of its regular duties: Col. D. W. Lockwood, Col. R. L. Hoxie, Maj. E. E. Winslow, Maj. Chester Harding, and Capt. William J. Barden.

Its personnel for the consideration and review of the report of the Ohio River Board only was as follows: Col. H. M. Adams, Col. Chas. E. L. B. Davis, Col. R. L. Hoxie, Lieut. Col. C. McD. Townsend, and Maj. E. Eveleth Winslow.

At the close of the preceding fiscal year the Board had taken final action on 109 reports out of the 156 ordered by the river and harbor act of March 3, 1905. During the year the remaining 47 cases were considered and disposed of. The following is a summary of the action taken and recommendations made by district officers and by the Board in reference to all preliminary examinations ordered by that act:

Favorable reports by district officers on preliminary examinations	105
Favorable reports by Board on preliminary examinations	85
Unfavorable reports by district officers on preliminary examinations	51
Unfavorable reports by Board on preliminary examinations	71
Favorable reports by district officers on surveys or estimates	78
Favorable reports by Board on surveys or estimates	67
Unfavorable reports by district officers on surveys or estimates	7
Unfavorable reports by Board on surveys or estimates	18
Cost of surveys recommended by district officers	$104,630.57
Cost of surveys recommended by Board	63,425.57
Difference	41,205.00
Estimated cost of improvements recommended by district officers	48,305,022.86
Estimated cost of improvements recommended by Board	33,342,518.28
Difference	14,962,504.58

The following indicates the action of Congress in regard to these cases:

Appropriated for above new work by act of March 2, 1907	$7,295,921.00
Authorized for above new work by act of March 2, 1907	11,382,850.00
Amount which must be provided in the future to complete, in addition to above sums	8,443,246.66
Total	27,122,017.66

The figures given above are not absolute for the reason that the sums involved in some projects are not susceptible of precise ascertainment, but the results are believed to be not far from the actual.

It will be seen that Congress has adopted projects involving the appropriation of more than 80 per cent of the sums recommended by the Board for expenditure in its reports reviewing preliminary examinations ordered by act of March 3, 1905. Of the 67 cases favorably reported by the Board, appropriations were made for 55, or about 82 per cent.

All of the examinations and surveys ordered in section 1 of the act of March 3, 1905, had been finally disposed of at the end of the fiscal year.

The case of Harlem Kills, New York, which was under consideration last year, in compliance with a resolution of the Committee on Rivers and Harbors of the House of Representatives, still remains

for final action, owing to the desirability of making current observations extending over a considerable period of time.

In compliance with resolutions of the same committee of Congress and instructions from the Chief of Engineers, the Board gave consideration to the following subjects during the fiscal year 1907:

Aransas Pass, Tex.
Mississippi River in Aitkin County, Minn.
Grays River, Wash.
Waterway between Lockport, Ill., and St. Louis, Mo.
Passaic River, N. J.
Wave action at certain harbors on Lake Michigan.
Bayou Teche, La.
Monterey Bay, Cal.
Grays Harbor bar, Wash.
Salem River, N. J.
Ahnapee Harbor, Wis.
Inner harbor at San Pedro, Cal.
St. Marys Falls Canal—new lock.
Galveston Harbor, Tex.
Inland Waterway, from Corpus Christi to Mississippi River.
Shallotte River, N. C.
Medomac River, Me.
Oakland Harbor, Cal.
Dredge for Oregon coast.
Westchester Creek, N. Y.
Ludington Harbor, Mich.
Charlotte Harbor, Fla.
St. Petersburg Harbor, Fla.
Olympia Harbor, Wash.
Columbia River from Bridgeport to Kettle Falls, Wash.
Gulfport Channel and Harbor, Ship Island Pass between Ship and Cat Islands.

Reports have been submitted on all of the above subjects, except the last five named, which are now under consideration.

In compliance with requests from the Committee on Commerce of the Senate, the Board has considered and reported upon the following subjects:

Sasanoa River, Me.
Youghiogheny River, Pa.
Cos Cob Harbor, Conn.

The act approved March 2, 1907, provided for 183 preliminary examinations and 17 miscellaneous examinations and surveys. On June 30, 1907, 64 reports on preliminary examinations had been received at the office of the Board, of which 16 had been finally disposed of, 35 had been returned recommending surveys or estimates, and 13 were under consideration. Of the miscellaneous cases, 2 had been received, of which 1 had been disposed of and 1 was under advisement.

In connection with the various subjects referred to it for report and recommendation, the Board gave public hearings to interested parties and made inspections as follows:

At Cold Spring Inlet, N. J., on August 7, 1906, in reference to the improvement of Cold Spring Inlet. An inspection of the locality was made.

At Pentwater, Mich., on November 9, 1906, in reference to Pentwater Harbor. The harbor was inspected.

At Galveston, Tex., November 21, 1906, in reference to Galveston Harbor, Inland Waterway from the Rio Grande to the Mississippi, and Galveston channel.

At Victoria, Tex., on November 22, 1906, in reference to channel from Aransas Pass to Victoria, on the Guadalupe River, and to Cuero.

At Corpus Christi, Tex., on November 24, 1906, in reference to Aransas Pass, Inland Waterway from the Rio Grande to the Mississippi, and channel from Corpus Christi through Turtle Cove to Aransas Pass.

At St. Louis, Mo., on November 27, 1906, in reference to a proposed 14-foot waterway from Lockport, Ill., to St. Louis, Mo.

At Fayetteville, N. C., on January 24, 1907, in reference to Cape Fear River between Wilmington and Fayetteville. The river was inspected between the points named.

At Erie, Pa., on June 6, 1907, in reference to Erie Harbor, with a view to obtaining a depth of 22 feet and protecting Presque Isle Peninsula. The harbor was inspected.

Thirteen informal hearings to Members of Congress and other interested persons were held at the office of the Board, as follows:

September 19, 1906, in reference to Tombigbee River, Miss.

October 15, 1906, in reference to New Bedford and Fairhaven harbors, Mass.

December 6, 1906, in reference to St. Michael Canal, Alaska.

December 7, 1906, in reference to Hilo Harbor, Hawaii.

December 18, 1906, in reference to Cold Spring Inlet, N. J.

December 19, 1906, in reference to Aransas Pass, Tex.

December 19, 1906, in reference to Inland Waterway from the Rio Grande to the Mississippi.

December 22, 1906, in reference to Cold Spring Inlet, N. J.

December 27, 1906, in reference to Grays Harbor bar, Wash.

January 5, 1907, in reference to Monterey Harbor, Cal.

January 5, 1907, in reference to Galveston Harbor and Inland Waterway from the Rio Grande to the Mississippi.

January 5, 1907, in reference to Medomac River, Me.

January 7, 1907, in reference to Withlacoochee River, Fla.

January 8, 1907, in reference to San Pedro Inner Harbor, Cal.

January 8, 1907, in reference to Inland Waterway from the Rio Grande to the Mississippi.

January 8, 1907, in reference to Galveston Harbor, Tex.

February 4, 1907, in reference to Sasanoa River, Me.

February 4, 1907, in reference to Youghiogheny River, Pa.

Expenses of the Board during the fiscal year may be briefly summarized as follows:

Rent of offices	$1,440.00
Salaries of civilian assistants	4,883.75
Mileage and traveling expenses	3,044.97
Miscellaneous	129.23
Total	9,497.95

D. W. LOCKWOOD,
Colonel, Corps of Engineers,
Senior Member of the Board.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

APPENDIX D D D.

SUPERVISION OF THE HARBOR OF NEW YORK.

REPORT OF COMMANDER H. H. HOSLEY, U. S. NAVY, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

WAR DEPARTMENT,
OFFICE OF THE SUPERVISOR OF THE HARBOR OF NEW YORK,
New York, July 9, 1907.

GENERAL: I have the honor to submit the following report of the operations of this office for the fiscal year ending June 30, 1907; also an estimate of amount of funds required for the fiscal year ending June 30, 1909.

During the period of the past fiscal year I was absent on other duty from July 1 until August 30, the office of supervisor being temporarily filled by Lieut.-Comd'r. Louis R. de Steiguer, U. S. Navy, who remained on duty as assistant after my return until December 18, 1906.

During the year the work of the office and force at my command have continued along the general lines established a few years ago, which have proved to be quite efficacious. There has been a perceptible falling off in the amount of spoil and refuse cared for. This is easily accounted for by the diminution of work on tunnels, the completion of dredging about new docks in the Chelsea district, and the failure on the part of certain contractors to continue work on the Ambrose and Bay Ridge channels. A great portion of the city's street sweepings have been utilized in reclaiming land in enlarging Rikers Island, while a portion of the same have been sent to Newark, Hastings, and other near-by places and used for filling in. A large amount of material has been utilized at Greenville, the new freight terminal of the Pennsylvania Railroad. Much of the dredgings arising through deepening of the Passaic River is made use of on the swamp lands to the westward of Newark Bay. But the greater portion of dredgings and cellar dirt continues to go to sea and is dumped to the eastward of Scotland light-ship. Frequent soundings are taken in this locality, and the material is distributed as much as possible, but the time is not far distant when the place of deposit will of necessity be moved seaward. This long tour through water and in weather more or less uncertain makes the towage bills heavy and the cost of improvements very much greater than they would be were it possible to avoid towing the spoil more than 25 miles in tidal currents. Most of the contractors and towboat owners realize

the importance of preventing illegal deposits in these waters and give every evidence of cooperation with the supervisor in his efforts to keep illegal dumping at the lowest possible minimum; but there are certain crafty tug masters that resort to every possible means to circumvent the inspectors in their duties of carrying out the law. Public-spirited individuals occasionally send in an anonymous letter containing information of violations of the law, but in this way we never obtain evidence that warrants the district attorney's proceeding against the parties at fault. Our only dependence is on our own force of inspectors, and when the weather conditions are bad the temptation to dump short is the strongest, and thus it is that it is imperative that the patrol must be kept up at all times. I am satisfied that were the patrol removed the harbor of New York would in about two months' time become inaccessible to the largest of the trans-Atlantic steamers. On frequent occasions the masters of towboats display exceedingly bad judgment and take unnecessary risks in proceeding toward the dumping ground during the prevalence of bad weather. This often results in discharging a portion or the whole of the cargo of the scows to prevent their sinking in the heavy seas which break over them, threatening disaster to the scow and greatly hazarding the life of the scowman, who is doing his duty on a very wet and slippery platform without any protecting rail or friendly hand to hand out a line or life preserver in case of trouble. Many of the scows in use are becoming much worn and very dangerous in case of bad weather. During the summer months a great deal of private dredging goes on up the Hudson, along Long Island Sound, and in the kills and bays around Staten Island. In many small inlets and creeks this work is carried on, maintaining channels to brickyards, ice houses, small manufactories, and other plants. The attempt to keep a careful watch on all these operations with the regular patrol boats is futile, and I am convinced that the proper way to maintain an espionage on work of this character is to charter, from time to time, one or more small boats capable of manipulation by one man, and then select the proper man with local knowledge of the scene of work and appoint him a deputy inspector. Thus the situation would be always well in hand. At present we have but one small boat capable of operation in shoal water, and this boat has no sleeping accommodation for the man in charge. In these days, when many of the smallest fishing boats are supplied with a motor, there are many desirable boats available for hire at a comparatively low cost. Such a boat would not be distinguishable from the dozens of others of similar appearance and would not unduly excite the suspicions of would-be violators of the law. Services of this character would not be required throughout the year, and the total cost would not be great. I have increased the usual estimates for maintenance of patrol fleet by $5,000, to meet expenses incurred in carrying out duty of this character. This is necessary to properly carry on the duty of proper patrol. A great many complaints and difficulties have arisen in several cases, owners of property contiguous to that under improvement being the principal complainants; in many cases oyster beds are involved. An inspector with local knowledge cruising about at all times seems indispensable, particularly in the Hudson, Passaic, Shrewsbury, and Raritan rivers.

The number of regular patrol boats seems adequate, but two of them are practically of but little use. The regular patrol is kept up by the *Lamont*, *Cerberus*, *Scout*, and *Nimrod*, the *Argus* being used as a spare boat. The *Vigilant* is kept for general duty, cruising throughout the limits of the waters coming within the jurisdiction of the supervisor. Of these vessels, the *Lamont*, *Cerberus*, and *Scout* are in very good condition and should remain so for some time without especial appropriation; the *Vigilant's* hull is in excellent condition, but her boilers and engines are steadily approaching the time when they will have to be renewed. Three thousand dollars was recently spent on the boat's boilers, but it is a makeshift at best; safety valves must be set at low and uneconomical limit; the engines are very wasteful through running at too low pressure. As an appropriation for this purpose would not be available for a year, I most urgently recommend an appropriation of $15,000 to renew engines and boilers of the *Vigilant*, and have included this in my estimates for the next fiscal year. Of the two remaining boats, the *Nimrod* and *Argus*, little that is good can be said; the hull of the former, and both hull and motive power of the latter, have reached such a state of age and deterioration through long service that they are entirely unfitted for duty as patrol boats under any but the most favorable circumstances of wind and weather. To use them outside the inner harbor would be courting disaster and loss of life, and would render it impossible to maintain an efficient patrol. During the last session of Congress the sum of $5,000 was appropriated to make the *Nimrod* seaworthy, and as this would become available on July 1, I have made the necessary arrangements to go ahead with the work as soon as the matter of the lowest responsible bidder is settled. Owing to the dangerous condition of the vessel she has been off duty for about two months. Through the courtesy of the commandant and naval constructor of the Brooklyn Navy-Yard I had the vessel towed to the yard, where she remained several days undergoing a very careful inspection by the naval constructor and his principal assistants. The following are extracts from a report of the naval constructor based upon his examination:

> The outside planking between wind and water is in very bad condition; * * * a number of main deck beams and fore and afters have either given away or are in such shape that their fastenings will soon become loose: * * * the main deck house and pilot house are in such condition that satisfactory repairs could hardly be made to obtain entire water-tightness; * * * in general, the hull and body show structural weakness throughout, and temporary repairs could not be made to last for any great length of time; * * * $5,000 will not cover the necesary hull and joiner work alone; * * * taking the boat as a whole I believe it would be better to sell her, if possible, and obtain a new one in her place.

Notwithstanding this valuable but unwelcome opinion, I deem it necessary to make the boat as serviceable as possible for inside waters on an expenditure of $5,000, as the *Argus* is absolutely unreliable. I have issued proposals for bids, and, judging from conversation with probable bidders, will be able to put the *Nimrod* in such condition that she can with careful nursing be made to last a year or more, when she will have to be replaced by another boat, either through purchase or construction. This being the condition which confronts us, I most strongly and urgently recommend an appropriation of $50,000 for a new patrol boat. Such a boat, if appropriated

for, would not be available for about eighteen months, and by that time a boat in place of the *Nimrod* will have become imperative. A recommendation for this appropriation appears in the estimates for the next fiscal year.

During the past year there has been the regular amount of discussion by the various parties concerned regarding the desirability of enacting laws governing the length of towlines used in these waters, but as usual no agreement seems possible, private pelf controlling the towboat men to the exclusion of the welfare of the general public and the safety of passengers embarked on the various craft plying the waters of the harbor, its entrances and tributaries. The congestion of traffic, particularly in the lower Hudson and East rivers, is steadily increasing, and that there are no more collisions speaks very well for the management of the vessels by those in charge. To hamper the movements of other craft through the use of excessively and unnecessarily long towlines should be criminal.

As outlined in previous reports there occur many cases of illegal disposition of spoil where the intent to violate the law is not clearly established, and where the facts do not seem to warrant appeal to the district court, as conviction would be impossible. In cases of this kind, where the work is being done for the Government or the city, and in some instances for private corporations, it has been found practicable to hold up payment to the dredging company for dredging any material that is known to have been dumped "short." During the past fiscal year the following checkages have been made under this heading:

	Cubic yards.
United States Engineer Department	1,156
Department of docks and ferries	170
Private contracts	4,254
Total	5,580

at an estimated average of 35 cents per cubic yard, amounting to $1,953.

Under the same contracts 184 pocket loads (averaging 150 cubic yards each, or a total of 27,600 cubic yards) were noted by the patrol boats as taken out to sea, where, failing to clear at the proper place of deposit, they were kept under surveillance until returned to the original point of loading and there deducted before reloading. This amount of material would have proved a large item of gain to the contractor could it have been disposed of on the way in without the knowledge of this office and before reaching the supervision of the parties for whom the work was done, the contractor not only having to bear the expense of retowing it to sea, but very frequently having to redredge it before being able to properly dispose of it.

At the beginning of the fiscal year just passed there were a number of cases of illegal dumping awaiting the action of the district courts. Some additional cases have been referred during the year, and I am happy to say that nearly all the cases have been brought to a trial and conviction obtained. This has been brought about through a change in the personnel and increase of vigorous action in the United States district attorney's office. A very few cases yet remain to be disposed of, but I am assured that the docket will soon be clear.

The following is a synopsis of cases settled or still pending:

CASE AGAINST THE TUG H. G. RUNKLE.

[Willis G. Hill, master; Andrew Hansen, scowman.]

A synopsis of this case appeared in the Annual Report of the Chief of Engineers for 1905, Appendix Z Z, page 2579.

December 7, 1904: Warrant issued.
June 30, 1907: Case pending. (F. 46/7.)

CASE AGAINST THE TUG CHARLES E. MATTHEWS.

[F. J. Walsh, master; J. D. Dailey and D. C. Ivins, owners.]

A synopsis of this case appeared in the Annual Report of the Chief of Engineers for 1906, Appendix A A A, page 2065.

December 12, 1905: Defendants indicted.
March 26, 1907: Dailey and Ivins tried, convicted, and fined $250. Nolle pros. as to Walsh. (F. 46/14.)

CASE AGAINST THE TUG JOHN FLEMING.

[Brown & Fleming Contracting Company, owners; J. Sullivan, mate in charge.]

A synopsis of this case appeared in the Annual Report of the Chief of Engineers for 1906, Appendix A A A, page 2065.

March 13, 1907: Brown & Fleming Contracting Company pleaded guilty Fined $250. Nolle pros. as to other defendants. (F. 46/15.)

CASE AGAINST THE BROWN & FLEMING CONTRACTING COMPANY.

A synopsis of this case appeared in the Annual Report of the Chief of Engineers for 1906, Appendix A A A, page 2065.

June 30, 1907: Case pending. (F. 46/16.)

CASE AGAINST THE TUG JOHN FLEMING.

[Thomas Clark, mate in charge; Brown & Fleming Contracting Company, owner.]

A synopsis of this case appeared in the Annual Report of the Chief of Engineers for 1906, Appendix A A A, page 2065.

June 15, 1906: Defendants indicted.
January 18, 1907: Brown & Fleming Contracting Company tried, convicted, and fined $250. Fine paid. Thomas Clark pleaded guilty during trial; fined $250.
March 13, 1907: Fine remitted as to Clark. (F. 46/17.)

CASE AGAINST THE TUG NONPARIEL.

[Frederick Bouchard, mate in charge; Frank Spadujoro, scowman of 108; and George Ferandes, scowman of 48.]

A synopsis of this case appeared in the Annual Report of the Chief of Engineers for 1906, Appendix A A A, page 2066.

June 15, 1906: Defendants indicted.
January 17, 1907: Fredrick Bouchard tried, convicted, and fined $250.
March 13, 1907: Fine remitted as to Bouchard, and nolle pros. as to other defendants. (F. 46/18.)

CASE AGAINST THE TUG JOHN T. PRATT.

[Columbia Dredging Company, Frank Ridgway, manager, 64 Broad street, New York, contractors; Charles Langton, master; J. Brown and J. Manny, scowmen.

A synopsis of this case appeared in the Annual Report of the Chief of Engineers for 1906, Appendix A A A, page 2066.

June 15, 1906: Defendants indicted.
June 19, 1906: Deductions made.
January 24, 1907: Columbia Dredging Company tried, convicted, and fined $250.
January 29, 1907: Sentence suspended as to Langton and Brown.
June 19, 1907: Nolle pros. as to Manny. (F. 46/19.)

CASE AGAINST THE TUG SUCCESS.

[Seely-Taylor Company, contractors; John R. Smith, master; John Doe, Richard Roe, and John Smith, scowmen.]

The contractors in this case were granted a permit for the deposit of material dredged from New Rochelle Harbor, New York, for the town of New Rochelle, at a point in Long Island Sound marked by a cedar buoy located 2½ miles north-northwest from Eaton's Neck light and in not less than 18 fathoms of water.

August 15, 1906, Deputy Inspector John J. O'Mara, pilot of the launch *Lookout*, was detailed to inspect this work; and on September 1, 1906, he saw the tug *Success*, Master John R. Smith, with three loaded dumpers in tow, *Nos. 8*, *9*, and *10*, leave New Rochelle Harbor bound for the dumping ground off Eaton's Neck light; at about 7.45 p. m. of that date, when the tow was at a point on the Sound about 2½miles S. E. by S. of said harbor, he saw the contents of said dumpers illegally deposited in the waters of Long Island Sound, when he immediately ran alongside the tug *Success* and placed the master under arrest.

October 9, 1906: Defendants indicted.
March 13, 1907: Seely-Taylor Company tried, convicted, and fined $350. Sentence suspended as to Smith. Nolle pros. as to other defendants. (F. 46/20.)

CASE AGAINST THE TUG O. L. HALENBECK.

[A. H. Hastorf, owner of dumpers; Peter Cahill, owner of tug; John D. Sjolund, master; Antonio Samuels and Charles Gose, scowmen.]

The tug *O. L. Halenbeck* proceeded to sea with dumpers *Montreal* and *Adelphia* fully loaded with clean soil in tow, passing the fort bound out about 8 a. m. of September 6, 1906, proceeding to sea by way of Ambrose channel; and at about 9 a. m. of that date, when at a point about half a mile north of the outer Gedney buoy, the patrol boat *Scout* (Charles Bell, master) saw the contents of the forward middle pocket of dumper *Montreal* and the contents of the second after and middle pockets of the dumper *Adelphia* illegally deposited. The patrol boat kept this tow under surveillance until the remainder of the contents of the dumpers were legally disposed of outside Scotland light-vessel, and upon the return of the tow inside the Narrows placed the master of the tug and scowmen under arrest.

As this seemed a flagrant violation of the law, in addition to a violation of the laws by using Ambrose channel contrary to orders of Secretary of War dated January 13, 1905, and after conference with Col. W. L. Marshall, Corps of Engineers, U. S. Army, the officer in charge of improvements in Ambrose channel, the case was referred to the United States district attorney recommending prosecution for both violations.

September 17, 1906: Warrant issued.
November 19, 1906: Defendants held to await action of grand jury in eastern district of New York.
June 30, 1907: Case pending. (F. 46/21.)

CASE AGAINST THE TUG JULIA C. MORAN.

[Henry Du Bois' Sons' Company, owners of dumpers; Alfred Walling, master of tug; and Peter Wilska, scowman.]

This tug proceeded to sea, having in tow dumpers *Nos. 17D* and *18D* fully loaded with mud dredged from the piers of the North German

Lloyd Company, [illegible] N. [illegible] [illegible] March [illegible] by the inside patrol boat and dumpers [illegible] fully loaded. At about [illegible] of March [illegible] on outside duty, William A. Pye, [illegible] the tow, which was then at a point about [illegible] the Inner Second fairway buoy in South channel, inspected the tow [illegible] found dumper 18D entirely empty, the contents of the dumper having been illegally deposited in the channel at some point between the tow and the Inner Second fairway buoy. The patrol boat kept the tow under surveillance until it reached the legal dumping ground outside Scotland light-ship, where the contents of 18D were legally deposited. Upon the return of the tow the scowman of 18D was placed under arrest.

Upon investigating this case it was found that the illegal deposit was due to ignorance on the part of the scowman of dumper 18D, who could neither speak our language nor understand the towing signals.

I therefore referred the case to the United States district attorney for the southern district of New York, with the recommendation that proceedings be instituted against the master of the tow and the owners of the dumpers, believing both equally guilty in the violation of law due to the pernicious custom of the employment of scowmen unfamiliar with towing signals, and in many instances unable to speak or understand our language.

May 7, 1907: Defendants [illegible]
May 8, 1907: Henry D. [illegible] Company [illegible] Alfred Walling [illegible]
June 19, 1907: [illegible]
May 8, 1907: [illegible]

During the [illegible] of material—[illegible] other [illegible] at property [illegible] head of New [illegible]

Permits issued	11,237
Average number of tows daily to sea	16
Average number of scows daily to sea	28

From the foregoing statement it will be seen that 9,112,956 cubic yards of mud, street sweepings, cellar dirt, etc., were deposited near the mouth of the harbor; 1,412,397 cubic yards of dredging spoils deposited in Long Island Sound, a large percentage of which—principally sand and shells—was utilized for the propagation of oysters, being scattered over oyster beds under supervision of the Shell Fish Commission of the State of Connecticut; 5,418 cubic yards of mud, etc., deposited in Fishers Island Sound; 7,950,195 cubic yards of cellar dirt, ashes, and other inoffensive material were used for filling in behind bulkheads, and 155,890 cubic yards of garbage, dead animals, offal, etc., were deposited on Barren Island for reduction.

The following is a statement of the appropriation for "Prevention of deposits, harbor of New York, 1907:"

For pay of inspectors, deputy inspectors, office force, and expenses of office		$10,260.00	
Expended to June 30, 1907	$10,216.78		
Outstanding liabilities	42.63		
		10,259.41	
			$0.59
For pay of crews and maintenance of six steam tugs and one launch		70,000.00	
Expended to June 30, 1907	$67,351.64		
Outstanding liabilities	2,498.42		
		69,850.06	
			149.94
Balance			150.53

The following is an estimate of appropriation required for service of the fiscal year ending June 30, 1909, by the supervisor of the harbor:

Detailed objects of expenditure and explanations.	Estimated amount that will be required for each object.	Amount appropriated for fiscal year ending June 30, 1908.
Prevention of obstructive and injurious deposits within the harbor and adjacent waters of New York City:		
For pay of inspectors, deputy inspectors, office force, and expenses of office	$10,260	$10,260
For pay of crews and maintenance of patrol fleet	80,000	75,000
Reconstructing hull and overhauling steam tug Nimrod	.....	5,000
Renewing engines and boilers of steam tug Vigilant	15,000	.....
For purchase or construction of 1 steam tug	50,000	.....
Total	155,260	90,260

Very respectfully, your obedient servant,

H. H. HOSLEY,
Commander, U. S. Navy, Supervisor.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

APPENDIX E E E.

ANNUAL REPORT OF THE CALIFORNIA DÉBRIS COMMISSION FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

CALIFORNIA DÉBRIS COMMISSION,
San Francisco, Cal., June 30, 1907.

GENERAL: The California Débris Commission has the honor to submit the following annual report for the fiscal year ending June 30, 1907:

The work in charge of the Commission was described in the Annual Report of the Chief of Engineers for 1905 (pp. 2585–2586).

REGULATION OF HYDRAULIC MINING.

During the past fiscal year the Commission received 33 applications for permits to mine by the hydraulic process under the requirements of the act of Congress approved March 1, 1893, as amended by the act approved February 27, 1907. During the same period 28 permits to operate by the hydraulic process were granted, inspections made by the Commission having demonstrated that suitable dams or barriers to properly impound débris from the mines proposed to be operated had been provided or were not necessary. A number of permits were revoked by the Commission during the past fiscal year, principally for the reason that the mines had been worked out or abandoned. During the year a number of licenses were temporarily suspended for various causes. Numerous personal inspections of mines were made during the year in connection with the work of requiring the operators of the mines to properly impound the débris resulting from their operations.

During the year maps of a survey made of the lower 30 miles of the Bear River in July, August, and September, 1905, which were destroyed by fire in San Francisco in April, 1906, were restored.

A survey was made during the year of the lower 16 miles of the Yuba River. This survey also included the Feather River for 1 mile above and about 4 miles below the mouth of the Yuba River.

A survey was also made during the year of the lower 27 miles of the American River.

All the surveys above referred to were made pursuant to the requirements of the act of Congress approved March 1, 1893, providing that the Commission should mature and adopt plans for the protection and improvement of the streams comprising the Sacramento and San Joaquin river systems for the purposes of navigation, and at the same time permit mining to be carried on by the hydraulic process.

A report, dated June 30, 1907, of future operations based on these surveys, on the results of the flood of March, 1907, and on information from other surces, is submitted herewith.

A special appropriation of $5,000 was made by the act of Congress approved June 30, 1906, as follows:

Expenses, California Débris Commission: For furniture, stationery, instruments, photographic appliances, and all labor and materials necessary to restore records and property of all sorts destroyed during the earthquake and consequent conflagration of April, nineteen hundred and six, at San Francisco, California, five thousand dollars, to continue available during the fiscal year nineteen hundred and seven.

The total amount of this special appropriation was expended during the past year in replacing and restoring indispensable property and records of the Commission destroyed by the conflagration in San Francisco in April, 1906.

Money statements.

FOR APPROPRIATION OF JUNE 30, 1906, FOR "EXPENSES OF CALIFORNIA DÉBRIS COMMISSION, 1907."

July 1, 1906, amount appropriated by act of Congress approved June 30, 1906	$15,000.00
June 30, 1907, amount expended during fiscal year	[a] 12,772.51
July 1, 1907, balance unexpended	2,227.49
July 1, 1907, outstanding liabilities	805.47
July 1, 1907, balance reverting to Treasury	1,422.02

FOR APPROPRIATION OF JUNE 30, 1906, FOR "EXPENSES OF CALIFORNIA DÉBRIS COMMISSION, 1906–7."

July 1, 1906, amount appropriated by act of Congress approved June 30, 1906	[b] $5,000.00
June 30, 1907, amount expended during fiscal year	5,000.00

FOR APPROPRIATION OF MARCH 4, 1907, FOR "EXPENSES OF CALIFORNIA DÉBRIS COMMISSION, 1908."

July 1, 1907, amount appropriated by act of Congress approved March 4, 1907	$15,000.00
Amount (estimated) required during the fiscal year ending June 30, 1909, for "Expenses of California Débris Commission, 1909," to regulate hydraulic mining operations in the State of California and make examinations and surveys for débris storage sites, as required by the act of Congress approved March 1, 1893	15,000.00

IMPROVEMENT AND PROTECTION OF RIVERS.

Under the project for improvement and protection of rivers, operations during the past fiscal year were in connection with the treatment of Yuba River, under the general plan for impounding and storing mine débris in that stream printed in the Annual Report of the Chief of Engineers for 1900. (Pt. 8, pp. 5030–5064.) These opera-

[a] In addition there was expended during the year $706.46 from the appropriation for "Expenses of California Débris Commission, 1906."

[b] Special appropriation to restore property and records of the California Débris Commission destroyed by fire in San Francisco, Cal., in April, 1906.

tions were principally in continuation of the operations in progress at the close of the last fiscal year, and were as follows:

Barrier No. 1, Yuba River, California.—At the close of the last fiscal year cement needed for the construction of a spillway at the south end of the barrier was being received at Marysville, Cal., under an emergency contract which had been entered into March 14, 1906, with the Western Fuel Company, of San Francisco. This contract was completed during the past year. The amount earned by the contractor for cement tested and accepted during the past fiscal year was as follows:

Cement furnished on board cars at Marysville, Cal., 9,427 sacks, at 62½ cents	$5,891.88
Less rebate of 5 cents each for 7,488 empty cement sacks returned to the contractor	374.40
	5,517.48
Deduct one-half payable by the State of California	2,758.74
Balance payable by the United States	2,758.74

At the close of the last fiscal year the above-mentioned cement was being unloaded from the cars at Marysville and hauled by teams from that point to the site of barrier No. 1 (a distance of about 16 miles) by George S. Risher, under an emergency contract dated March 22, 1906. This contract was completed on August 10, 1906. The amount earned by the contractor during the past fiscal year was as follows:

Hauling 7,370 sacks of cement from Marysville, Cal., to barrier No. 1, Yuba River, California, at 68.9 cents per four sacks	$1,269.48
Deduct one-half payable by the State of California	634.74
Balance payable by the United States	634.74

At the close of the last fiscal year the work of constructing a spillway at the south end of barrier No. 1, in accordance with plans opposite page 2078 of the Annual Report of the Chief of Engineers for 1906, and placing large rock along the river bed immediately below the apron of the barrier to arrest scour, was in progress under a contract entered into April 11, 1906, with Edward Malley, of San Francisco, Cal. This contract was completed on December 14, 1906. The amount earned by the contractor during the past fiscal year was as follows:

Earth excavated from spillway, 7,864 cubic yards, at 80 cents	$6,291.20
Rock excavated from spillway, 2,001 cubic yards, at $1	2,001.00
Earth excavated from foundation for side wall of spillway, 520 cubic yards, at $1.25	650.00
Rock excavated from foundation for side wall of spillway, 477 cubic yards, at $2	954.00
Concrete placed in side wall of spillway (cement for concrete furnished by the United States and State of California), 2,291.2 cubic yards, at $5	11,456.00
Large rock furnished and placed below apron of barrier, 3,418.71 tons, at $2.50	8,546.78
Steel railroad rails for track between barrier and stone quarry, 33 tons, at $46	1,518.00
Labor furnished for railroad track between barrier and stone quarry and labor furnished to place additional materials in the portions of the barrier built in previous years	2,247.12
Plant purchased of the contractor	3,803.71
Board furnished employees of United States and State of California by the contractor	48.50
	37,546.31

Less for rent of plant and for materials furnished the contractor by the United States and State of California	$106.19	
Less expenses of United States and State of California incurred after date originally set for completion of the contract	257.50	
		$363.69
		37,152.62
Deduct one-half payable by the State of California		18,576.31
Balance payable by the United States		18,576.31

On February 23, 1907, a formal contract was entered into with Edward Malley, of San Francisco, Cal., for enlarging the spillway at the south end of the barrier, the construction of a concrete sill across the entrance to the spillway, the extension of the concrete side wall between the spillway and the river, the construction of the third step of the barrier, the extension of the north abutment of the barrier, and the quarrying and placing of large rock along the toe of the barrier to arrest scour. The contract provided that the contractor should furnish all the labor and materials required in this work except cement and piles, which two items were to be furnished by the United States and State of California. The contract provided also that the contractor should furnish all the plant needed to do the work in addition to the plant of the United States and State of California already on the ground. The contractor commenced work under the contract promptly, and up to March 17, 1907, on which date about one-half of the barrier was swept away by high water, had performed the following work:

Earth excavated from spillway, 1,634.5 cubic yards, at 99 cents	$1,618.16
Rock excavated from spillway, 772.5 cubic yards, at $1.50	1,158.75
	2,776.91
Deduct one-half payable by the State of California	1,388.46
Balance payable by the United States	1,388.46

On account of the extensive damage sustained by barrier No. 1 by the floods of the month of March, 1907, work under the contract with Mr. Malley, dated February 23, 1907, was stopped and settlement made with him as above on June 25, 1907.

Unprecedented and disastrous floods occurred in many regions of the central portion of the State of California during the month of March, 1907, especially in the area drained by the Feather and Yuba rivers. The Feather River was reported, about the middle of March, to be 4 feet higher than the highest known floods, in 1861 and 1862, and the Yuba River was 13 inches higher than its previous high-water record. Widespread damage was caused by the extensive levee systems along the Sacramento River and its tributaries being overtopped and broken in places. Many bridges were lost and miles of railroad track damaged. Marysville was without railroad service for over ten days and San Francisco was practically isolated for over one week by failures of bridges and railroad beds. At about the time the Yuba River reached its extreme height at the barrier, on the night of March 17, 1907, about 600 feet of the south end of the barrier went out. The barrier was about 1,250 feet long, so that practically one-half of it was swept away. The pool formed by the barrier being full of mine débris at the time of the flood, the enormous quantities of

cobbles, gravel, etc., brought down were carried over the barrier and by their weight and velocity created a powerful wearing effect on the concrete covering of the barrier and on that of the apron below the barrier. In places the concrete covering, which was 18 inches thick, was worn through, permitting the water to reach and scour out the rock fill comprising the core of the barrier, which resulted in its failure.

Barrier No. 1, so far as it had been constructed up to March 17, 1907, was 14 feet high throughout its length of about 1,250 feet, and at that date it was filled to its crest with mine débris. It is estimated that it was storing 3,000,000 cubic yards of débris. The barrier consisted of two steps, as shown in photograph following page 2078 of the Annual Report for 1906, the lower step being 6 feet in height, the upper step 8 feet in height. Extending entirely across the river bed below the lower step was a concrete apron 18 inches thick and 16 feet wide. The lower step and apron were built in 1904, practically in accordance with the plans printed as Appendix B accompanying the Annual Report for the fiscal year ending June 30, 1904. The second or upper step of the barrier was constructed in 1905, in accordance with the plans printed opposite page 2602 of the Annual Report of the Chief of Engineers for 1905. The two steps and apron were so constructed as to form one structure. The plans last above referred to contemplated the construction at a future time of a third step 8 feet in height immediately upstream from and connecting with the second step. The contract with Edward Malley, dated February 23, 1907, provided for the construction of the third step during the present summer, but owing to the extensive damage sustained by the barrier during the floods of March, 1907, further work on the structure has been abandoned.

Roadway.—In acquiring rights to certain lands in the vicinity of barrier No. 1 the United States and State of California obligated themselves to change, in places, a roadway of the Excelsior Water and Mining Company between Parks Bar bridge and the Bonanza Ranch house wherever the roadway should be drowned out by the raising of the level of the waters of the Yuba River by the construction of restraining barriers. The roadway was changed in several places several years ago. During the past year the roadway was improved at these places at an expense of $1,679.30, one-half of which amount being payable by each the United States and State of California.

Training walls.—The work of constructing gravel embankments by means of gold dredges to confine and control the flow of Yuba River in the vicinity of Daguerre Point, under agreements with W. P. Hammon and associates, was continued during the past fiscal year. The embankments to be built by Mr. Hammon and associates are to be in all about 20,500 feet long, 300 feet wide on the base, and 30 feet in height at the highest places. About 14,000 feet of the total of 20,500 feet of these embankments have thus far been completed, 8,000 of which was thrown up during the past fiscal year. Mr. Hammon and associates operated seven gold dredges on this work during the past year. The embankments are being constructed for the United States and State of California in exchange for the right to extract gold from the gravel used in making the embankments.

Reference was made at page 2075 of the last annual report to a gravel embankment to be built below Daguerre Point by the Marysville Gold Dredging Company, successor to John Martin. This embankment is to be constructed by means of gold dredges, and is to be about 8,200 feet long, 300 feet wide on the base, and 30 feet in height at the highest places. About 500 feet of the total of 8,200 feet of this embankment has thus far been completed, all of which was done during the past fiscal year. One gold dredge was employed in this work during a part of the past year. The embankment is being constructed for the United States and State of California in exchange for the right to extract gold from the gravel used in making the embankment.

The work of constructing a gravel embankment extending downstream along the north bank of the Yuba River from Daguerre Point under a contract dated March 29, 1905, with Anson B. Munson, of Stockton, Cal., was continued during the past year. This embankment is for the purpose of assisting in confining and directing the river at high stages. The dimensions of the embankment, as provided in the contract of March 29, 1905, are: Length, about 12,000 feet; height, 11 to 13 feet; width on top, 10 feet. Up to the time of the floods of March, 1907, the contractor had constructed about 10,000 feet of this embankment, about 1,000 feet of which, however, was carried away by the floods above referred to. The amount earned by the contractor during the past fiscal year was as follows:

Earth embankment constructed, 85,917 cubic yards, at 12.4 cents per cubic yard	$10,653.70
Deduct one-half payable by the State of California	5,326.85
Balance payable by the United States	5,326.85

In addition to the foregoing, the sum of $2,700.98 (one-half of which was paid by the United States and one-half by the State of California) was paid Anson B. Munson for work done by him not covered by the contract of March 25, 1905. This additional work consisted principally of placing brush along portions of the embankment below Daguerre Point to prevent scour.

During the floods of March, 1907, about 1,000 feet, or about 30,000 cubic yards, of the embankment built under the contract with Anson B. Munson of March 29, 1905, was carried away. The flow of the water through the embankment at the break caused about 12,000 additional cubic yards of material to be scoured out and carried away from the site of that portion of the embankment. Therefore the rebuilding of that part of the embankment will involve the replacing of about 42,000 cubic yards of material. It is proposed to replace this material as soon as practicable, and also to strengthen the embankment by constructing gravel wing walls, the latter and portions of the main embankment to be protected against scour by brush.

Settling basin.—On August 30, 1906, an emergency contract was entered into with Halsey H. Dunning, of Marysville, Cal., for constructing reenforced concrete culverts for gates at the entrance to the proposed settling basin on the south side of Yuba River near Daguerre Point. This contract provided that the contractor should also construct the necessary retaining and wing walls, do the excavating, backfilling, and grading necessary for foundations and for the waterway leading to and away from the proposed gates, and for

a roadway over the top of the culverts. The contractor commenced work under this contract on September 17, 1906, and completed it on January 25, 1907. The amount paid the contractor under this contract was as follows:

Earth excavated, 1,900 cubic yards, at 38 cents	$722.00
Rock excavated, 336 cubic yards, at $1.65	554.40
Backfilling and grading, 850 cubic yards, at 20 cents	170.00
Concrete furnished and placed (cement for concrete furnished by the United States and State of California), 273.4 cubic yards, at $6.25	1,708.75
Reenforcing steel furnished in place, 12,675 pounds, at 7 cents	887.25
Extra labor furnished by contractor	26.96
	4,069.36
Deduct one-half payable by the State of California	2,034.68
Balance payable by the United States	2,034.68

The appended money statement includes only funds appropriated by Congress, and does not include funds appropriated by the legislature of California.

Money statement.

FOR APPROPRIATION FOR RESTRAINING MINE DÉBRIS IN CALIFORNIA.

July 1, 1906, balance unexpended	$187,508.89
June 30, 1907, amount expended during fiscal year, for works of improvement	46,095.11
July 1, 1907, balance unexpended	141,413.78
July 1, 1907, outstanding liabilities payable by United States	1,636.12
July 1, 1907, balance available	139,777.66
July 1, 1907, amount of United States funds covered by uncompleted contract	538.35

APPROPRIATIONS BY CONGRESS.

June 3, 1896	$250,000
June 13, 1902	150,000
Total	400,000

Respectfully submitted.

JOHN BIDDLE,
Lieut. Col., Corps of Engineers.
C. H. MCKINSTRY,
Major, Corps of Engineers.
THOS. H. JACKSON,
Captain, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

CONTRACTS IN FORCE.

ABSTRACT OF FORMAL CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR CONSTRUCTING EMBANKMENT NEAR DAGUERRE POINT, YUBA RIVER, CALIFORNIA.

Name of contractor, Anson B. Munson; contract approved April 12, 1905; work to be begun on or before June 16, 1905, and to be completed on or before June 18, 1906. (Time for completion afterwards extended.) The contract provided that the contractor shall construct 200,000 yards of embankment fill, at 12.4 cents per cubic yard.

ABSTRACT OF EMERGENCY CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR FURNISHING CEMENT FOR USE IN CONSTRUCTING SPILLWAY AT BARRIER NO. 1, YUBA RIVER, CALIFORNIA.

Name of contractor, Western Fuel Company; contract entered into March 14, 1906; work to be begun before July 1, 1906, and to be completed before August 1, 1906. The contract provided that the contractor should furnish and deliver at Marysville, Cal., about 12,000 sacks of "Standard" (American) Portland cement, at 62½ cents per sack (each sack containing about 93 pounds of cement), and that a rebate of 5 cents each shall be allowed for empty sacks returned in good condition, free on board cars at Marysville, Cal.

ABSTRACT OF EMERGENCY CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR HAULING CEMENT FOR USE IN CONSTRUCTING SPILLWAY AT BARRIER NO. 1, YUBA RIVER, CALIFORNIA.

Name of contractor, George S. Risher; contract entered into March 22, 1906; work to be begun and completed by August 1, 1906. The contract provided that the contractor should unload 12,000 sacks of cement from cars at Marysville, Cal., haul and deliver the same at the site of barrier No. 1, Yuba River, California (a distance of about 17 miles), and there store it in cement storehouse belonging to the United States and State of California, at 17.225 cents per sack (weight about 94 pounds each).

ABSTRACT OF FORMAL CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR CONSTRUCTING SPILLWAY AND PLACING LARGE ROCK AT BARRIER NO. 1, YUBA RIVER, CALIFORNIA.

Name of contractor, Edward Malley; contract approved April 18, 1906; work to be begun on or before May 15, 1906, and to be completed on or before September 30, 1906. (Time for completion afterwards extended.) The contract provided that the contractor should excavate 12,000 cubic yards of earth from spillway, at 80 cents per cubic yard; excavate 3,000 cubic yards of rock from spillway, at $1 per cubic yard; excavate 450 cubic yards of earth from foundation, at $1.25 per cubic yard; excavate 350 cubic yards of rock from foundation, at $2 per cubic yard; furnish material (except cement) for and place 2,900 cubic yards of concrete, at $5 per cubic yard; furnish and place 5,000 tons of large rock, at $2.50 per ton of 2,000 pounds; furnish, deliver, and place 33 tons of new steel rails, 25 pounds per linear yard, at $46 per ton of 2,000 pounds.

ABSTRACT OF EMERGENCY CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR CONSTRUCTING REENFORCED CONCRETE CULVERTS, ETC., FOR GATES AT ENTRANCE TO PROPOSED SETTLING BASIN, YUBA RIVER, CALIFORNIA.

Name of contractor, Halsey H. Dunning; contract entered into August 30, 1906; work to be begun on or before September 29, 1906, and to be completed on or before November 28, 1906. (Time for completion afterwards extended.) The contract provided that the contractor should furnish all material (except cement) for, and construct and place, reenforced concrete culverts for gates at the entrance to a proposed settling basin, including retaining walls and wing walls, and the excavation, back filling and grading necessary for foundations and for the waterway leading to and away from the proposed gates, and for a roadway over the top of the culverts connecting with an embankment already in place. Contract prices: Excavating 1,500 yards of earth, at 38 cents per cubic

yard; excavating 750 yards of rock, at $1.65 per cubic yard; back filling and grading 980 yards of material, at 20 cents per cubic yard; furnishing material (except cement) for and placing 245 yards of concrete, at $6.25 per cubic yard; furnishing, delivering, and placing 12,675 pounds of reenforcing steel, at 7 cents per pound.

ABSTRACT OF EMERGENCY CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR RENT OF ROOMS, ETC., AS AN OFFICE AT HAMMON CITY, YUBA COUNTY, CAL.

Name of contractor, Richard Day; contract entered into October 9, 1906, to become effective on or about October 9, 1906, and to terminate on or about February 9, 1907. The contract provided that the contractor should rent two rooms, including light and janitor service, at Hammon City, Cal., at $10 per month.

ABSTRACT OF FORMAL CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR ENLARGING SPILLWAY AND BUILDING A PORTION OF BARRIER NO. 1, YUBA RIVER, CALIFORNIA.

Name of contractor, Edward Malley; contract approved March 8, 1907; work to be begun on or before April 18, 1907, and to be completed by October 31, 1907. The contract provided that the contractor should excavate 75,000 yards of earth, at 99 cents per cubic yard; excavate 15,000 yards of rock, at $1.50 per cubic yard; excavate 3,000 yards of material for bulkhead trench, at 75 cents per cubic yard; furnish all materials (except cement) for, and deliver and place 400 yards of concrete for entrance sill, at $7 per cubic yard, 800 yards of concrete for side wall, at $6 per cubic yard, 1,900 yards of barrier covering concrete, at $6 per cubic yard, and 48 yards of concrete for abutment, at $6 per cubic yard; drive 210 piles, at $20 each; furnish, deliver, and place 55,000 feet of bulkhead timber, at $45 per 1,000 feet board measure, 7,000 tons of rock fill (including sluicing of sand and gravel), at $1.75 per ton, 5,000 tons of large rock to protect toe of barrier, at $2.50 per ton, 7,400 feet of 1-inch wire cable, at 15 cents per linear foot, and 2,700 pounds of 3-inch mesh (No. 10 U. S. gauge) expanded metal, at 10 cents per pound.

ABSTRACT OF EMERGENCY CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR RENTING OFFICE ROOMS IN SAN FRANCISCO, CAL., FOR USE OF THE CALIFORNIA DÉBRIS COMMISSION.

Name of contractor, Elizabeth J. Kennedy; contract entered into and to become effective June 1, 1906, and to terminate May 6, 1907. The contract provided that the contractor should rent rooms to the United States at No. 1733 Pine street, San Francisco, Cal., to be used as office rooms by the California Débris Commission, at $45 per month.

ABSTRACT OF EMERGENCY CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR RENTING AN OFFICE ROOM IN FAIR OAKS, CAL.

Name of contractor, Thos. P. McEldowney; contract entered into and to become effective July 25, 1906, and to terminate on or before October 1, 1906. The contract provided that the contractor should rent one room as an office, at $5 per month.

ABSTRACT OF EMERGENCY CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR RENTING ONE HOUSE IN MARYSVILLE, CAL.

Name of contractor, Mary Schimpf; contract dated September 20, 1906, to become effective on or about September 20, 1906, and to terminate on or before November 30, 1906. The contract provided that the contractor should rent one house, to be used as an office, at $15 per month.

ABSTRACT OF EMERGENCY CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR RENTING AN OFFICE ROOM IN FOLSOM, CAL.

Name of contractor, Jennie S. Bates; contract entered into and to become effective September 13, 1906, and to terminate on or before November 1, 1906. The contract provided that the contractor should rent one office room at $6 per month.

ABSTRACT OF EMERGENCY CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1907, FOR RENTING AN OFFICE ROOM IN SACRAMENTO, CAL.

Name of contractor, John T. Stoll; contract dated September 29, 1906, to become effective September 30, 1906, and to terminate on or before November 30, 1906. The contract provided that the contractor should rent one office room at $5 per month.

REPORT OF CALIFORNIA DÉBRIS COMMISSION WITH REGARD TO FUTURE OPERATIONS FOR CONTROL OF MINING DÉBRIS, IMPROVING NAVIGABILITY, AND PROVIDING FOR CONTROL OF FLOODS ON THE SACRAMENTO AND FEATHER RIVERS, CALIFORNIA.

SAN FRANCISCO, CAL., *June 30, 1907.*

GENERAL: Under date of February 11, 1907, the California Débris Commission, consisting then of Col. W. H. Heuer, Maj. C. H. McKinstry, and Maj. Wm. W. Harts, submitted a report recapitulating the work done and results obtained to that time and proposing future work. The following report is based upon that of February 11, 1907. The changes made by the present Commission are not changes in principle, but only in details, and have been rendered advisable by events which have occurred since the date of the former report.

The principal duties of the Commission, as prescribed by the Caminetti act, are:

First. To regulate hydraulic mining so as to permit the fullest resumption of this industry compatible with the protection and restoration of the navigability of the Sacramento, Feather, and San Joaquin rivers and the prevention of damage from overflow, etc.

Second. To improve the navigability of all the rivers of this system, deepen their channels, and protect their banks, with a view of restoring, as near as practicable and the necessities of commerce and navigation demand, the navigability of said rivers to the condition existing in 1860, and, further, to afford relief in flood time and to provide sufficient water to maintain scouring force in the summer season.

The first of these objects may be said to have been accomplished.

The plan adopted was, in brief, to require each miner to impound the tailings resulting from his operations on land owned or controlled by him behind dams to be approved by the Commission. The two types of dam found most useful were log crib dams filled with quarried rock and brush dams. For these types standard specifications are now authorized. Earth or gravel dams, with spillways excavated in the bed rock of the banks, were used where sites permitted.

Under this plan hydraulic mining is carried on at the present time under the supervision of the Commission. While it is doubtless a fact that some illegal hydraulic mining is done and that occasionally restraining dams behind which tailings are stored fail under suspicious circumstances, it is nevertheless true that the work of the Commission is preventing any considerable addition of débris to that already in the river beds. The downward movement of the débris which had already been dislodged at the time the Commission was created has of course continued, except as checked by the Commission's restraining works in the Yuba, to be presently described.

Before proceeding to the description of the investigations and work done under the second head it is well to point out that while the ultimate object is the restoration of former conditions of navigability, direct operations looking to improvement of depths could not be undertaken until an effort had been made to check the influx of débris into navigable streams. The first of the débris-carrying tributaries to be investigated was the Yuba, because this stream contains more débris, the further movement of which would be injurious to navigation, than do all the other tributaries of the Sacramento combined. The Commission's plan for the Yuba is well under way and bids fair to be successful. It is more particularly described below. The investigations made of the Bear and American indicate that while some dredging in the lower reaches may perhaps be desirable, restraining works will be too costly for the good accomplished. The facts on which this conclusion is based are given below:

Yuba River project.—The project for the Yuba River contemplates (1) holding the great quantities of mining débris now in that stream and its tributaries by works built in the river bed at and above Daguerre Point, and (2) restricting the low-water channel below Daguerre Point within narrower, well-defined limits, in order to preserve in place as much as possible of the extensive deposits in the last few miles of the river.

These objects were to be accomplished (1) by the construction of four restraining barriers and a settling basin in the bed of the river, the structures to be provided with necessary weirs and conduits to regulate the inflow and outflow of water and to cause a deposition of the finer material carried in suspension, and (2) by the construction of two training walls. (See H. Doc. No. 431, 56th Cong., 1st sess.)

Work done under this project. The condition of the work under this project is as follows:

(*a*) *Barrier No. 1.*—This barrier had been completed to a height of 14 feet and a contract had been entered into for adding a step 8 feet high and increasing the width of the spillway, and work under same had been begun when about 600 feet of the barrier was destroyed by the flood of March, 1907.

A full report of the destruction of this structure was made to the Chief of Engineers on April 1, 1907.

It is not considered advisable to rebuild, and no further work on same is contemplated.

(*b*) *Barrier No. 4.*—About 95 per cent of this barrier, known as the Daguerre Point barrier, has been completed, and the remainder will be completed as soon as the training walls below are constructed.

This barrier is a dredger embankment thrown up by the dredgers of the Yuba Consolidated Gold Fields, under an agreement with that company, and without cost to the United States.

In connection with this barrier and to serve as a spillway a cut has been made across Daguerre Point of sufficient capacity to take the flood discharge of the stream. It was completed in January, 1906.

(*c*) *Settling basin.*—The entrance gates were completed in January, 1907. An agreement has been made with the Marysville Gold Dredging Company to construct, without cost to the United States, about 4,400 feet of embankment on the south side of the basin, and work is under way. An agreement has been made with Mr. James

O'Brien to raise, without cost to the United States, the present levee along the river side.

(*d*) *Training works.*—Agreements have been made with the above gold-dredging companies to construct, without cost to the United States, the south training wall, and about 4,000 feet, or one-third of it, has been completed.

A contract is in force for the construction of the north training wall, and about 90 per cent of the work has been done.

The embankments referred to above as being constructed by the gold-dredging companies, without cost to the United States, are a portion of the embankments which they construct to "impound" themselves—that is, to prevent their tailings from working into the stream below and to permit operations at high stages of the river.

Work remaining to be done—(*a*) *Barriers.*—No further work is contemplated on barrier No. 1. No work is contemplated on barrier No. 2. Barrier No. 4 will be completed without cost to the United States, and with an average height of 30 feet will furnish storage for about eight years. After the first storage season, however, the Daguerre Point Cut spillway and the entrance gates to the settling basin will have to be raised from time to time. About $100,000 are available for this work, which sum should be sufficient for about five years.

(*b*) *Settling basin.*—The outlet gates of this basin and a portion of the levee on the south side, about 6,000 feet, remain to be constructed before the basin will be available for use.

To obtain the full capacity of this basin it will be necessary later to raise the west side levee to a height beyond that called for in the agreement with Mr. O'Brien.

It is estimated that this work can be done at a cost not exceeding $130,000.

(*c*) *Training works.*—The south training wall will be completed to the length of about 2 miles without cost to the United States, and the north training wall to the same length at a cost of about $50,000.

It is thought that the funds available are sufficient for the completion of the works contemplated at present under the project and to maintain same for several years after they are put in use. On the other hand, it is not possible to state at the present moment whether it may not prove necessary to extend the training walls beyond the length now contemplated.

The following methods of protecting the navigable streams from the influx of mining débris have been investigated.

(a) The construction of storage reservoirs in the high canyons of the rivers into which mines might drain their tailings, thus storing the detritus in regions where land was cheap and material for dam construction easily obtainable.

(*b*) The diversion of the rivers into the "tule" lands along the Sacramento and Feather rivers, thus raising these lands and reclaiming them for agricultural purposes.

(c) The construction of settling basins in the lower reaches of the streams.

(d) The dredging of the beds of the navigable and the nonnavigable streams, placing the excavated material on the banks to assist in flood control and land protection.

The last-named method is the one which it is the main object of this report to explain and recommend.

High sites for storage dams.—Thorough investigation indicates that this method, though successful in other places, can not be satisfactorily applied in the high Sierras. Few capacious reservoir sites are available at which dams are practicable at reasonable expense or in locations where the reservoirs would serve many or large mines.

In some of the small tributaries several places were found where high dams might be erected, but the great cost of these dams compared with the amount of benefit to be derived therefrom and the prohibitive burden on the mines if taxed therefor as prescribed in the law, combined with the small capacity of the reservoirs, rendered their construction inadvisable. The method of using high dams, therefore, in any of these streams, or in their higher tributaries, was abandoned by the Commission as impracticable.

Diversion into the "tules."—The only overflowed land that could be used for this purpose without carrying the entire flow of the Yuba or other of the débris-carrying streams entirely over or under the Feather or Sacramento rivers, or both, is the area known as the "American Basin," lying east of the Sacramento between the Bear and American. It was manifestly impracticable to carry, at reasonable cost, even a small river like the Bear over or under the Sacramento.

In order to carry débris, surface slopes must be comparatively high. In the Yuba the finest material is deposited where the slopes are about 5 feet to the mile, fine gravel where the slope is about 10 feet to the mile, and coarse gravel and small bowlders on slopes from 14 to 15 feet to the mile. These figures result from examining the river bed at various places and of course are approximate only. In order, therefore, to carry fine material alone the minimum slope of any diversion canal, to carry débris, should be at least 5 feet to the mile. The average miner's sluice has a fall of about 7 inches to the 12-foot box. This is equivalent to over 250 feet per mile.

Diversion of the Yuba.—The lowest point in the Yuba River at which the flow could be diverted is in the vicinity of Daguerre Point. This is at an elevation of about 120 feet above the sea, to which possibly might be added a few feet by embankments in the river bed. The elevation of the American Basin is approximately 20 feet, and in order to make a deposit, say, 6 feet deep, the outlet of the canal should be at an elevation of, say, 30 feet. This would leave a fall of 90 feet or less, distributed over a distance of not less than 30 miles, giving an average slope of 3 feet per mile. A uniform slope would be impracticable, and the minimum would be far less than the average. It is thus plain that there is not sufficient fall to carry effectively even the very fine materials.

Furthermore, the right of way for such a plan would require probably 16,000 acres of land and would lie in valuable agricultural regions. The cost of the right of way might amount to $1,600,000. These two objections, lack of grade, and high expense for right of way render the adoption of this method of disposing of mining débris inadvisable at the present time for the Yuba.

Diversion of the Bear.—A study of the Bear River leads to the same conclusions.

Diversion of the American.—Applied to the American River the conditions are somewhat more favorable, but even here this plan was abandoned for similar reasons. This matter was examined at the time of the survey of 1906. The owners of the overflowed land demand about $50 an acre for it, even though the land would ultimately be benefited and would then be returned to them. A company has already been formed to reclaim this land and is now preparing plans for the work. After reclamation the land will be worth upward of $100 an acre; reclamation is said to cost approximately $10 an acre. The land has therefore a high prospective value. The cost of a right of way for a diversion project consequently is prohibitive.

Settling basins and low barriers.—The application of this method of treatment to the Yuba has already been described.

The total available storage capacity in the Yuba River bed is about 60,000,000 cubic yards, 20,000,000 cubic yards in the settling basin and 40,000,000 cubic yards in the river bed above Daguerre Point barriers.

By comparison of the surveys of 1899 and 1904 it is ascertained that the increment of débris in these five years amounted to about 15,800,000 cubic yards, or an average annual addition of slightly over 3,000,000 cubic yards. The additions to the river bed between the surveys of 1899 and 1906 amount to a total of 18,100,000 cubic yards, of which 15,100,000 cubic yards were below the barrier and 3,000,000 cubic yards above. These results show a scour below the barrier and a substantial addition above, thus demonstrating the effect then being produced by the barrier. They also indicate that the annual flow of débris for the years 1905–6 was somewhat less than the average.

At an average rate of 3,000,000 cubic yards per year there is then storage in the Yuba bed for over twenty years. As the rate of débris flow will diminish with time unless the restrictions on hydraulic mining are relaxed, the actual period should be greater.

It is hoped that the settling basin may be completed during 1909 and that the training walls below Daguerre Point may be completed about the same time.

After the present storage is exhausted, it will be practicable and may be found advisable to use the space between the training walls and the river banks between Daguerre Point and the mouth.

Settling basins and barriers for the Bear.—The control of such mining débris as is brought down by this river, by means of settling basins and impounding dams similar to those of the Yuba River, was carefully studied and sites selected where such works could be economically placed. It is estimated that a high dam could be built in the vicinity of Van Giesens for about $70,000, and a settling basin in the lower river for about $230,000, which combined would store 20,000,000 cubic yards of débris, at a cost of 1½ cents per cubic yard.

The most desirable site for the settling basin is in the vicinity of Camp Far West, but this land is in the hands of a gold dredging company which refuses to part with it for any reasonable price. Another practicable site was found in the vicinity of the county bridge.

As planned both of these settling basins were to be constructed of gravel embankments sufficiently high never to be overtopped, and were to have concrete spillways designed to take the maximum flow of the river.

The reports of these investigations were lost in the fire of April 18, 1906. The maps[a] herewith have been traced from blueprints of the original maps.

In view of the recommendations herein, the Commission has not thought it necessary to go to the expense of reproducing the calculations and plans.

Settling basins and barriers for the American.—The only site available for storage is the "American Basin," in which, as explained in paragraph 15, the cost of land would be prohibitively expensive. To control the débris of the American by means of settling basins or by diversion would far exceed the cost per cubic yard of storage on the other rivers. A rough estimate shows that any adequate system would cost more than $500,000.

After careful consideration we are of opinion that while this method of treatment is being successfully applied to the Yuba, its great cost on the Bear and American would render its application to these streams inadvisable.

Dredging.—The remaining method of treatment is dredging. Suction dredges would be used and the excavated material would be thrown up into levees along the banks. Applied to the lower courses of the nonnavigable tributaries this method would have the advantage of combining protection from flood overflow and better drainage with disposal and control of débris. Its additional advantages when applied to navigable streams will be pointed out later.

As to the relative cost of disposing of material by dredging and by settling basins and low barriers, storage by the latter method may be obtained at a cost of about 2 cents per cubic yard, while it is estimated that dredging will cost about 6 cents. A large suction dredge with a capacity of about 150,000 cubic yards per month can be built for about $120,000. The expenses of operation would amount to about $5,000 per month, including maintenance and repairs. For seven months in the year operations can be carried on without serious interruptions from high water.

It appears, therefore, that for those portions of the Bear and American where either dredging or barriers and settling basins could be used, the method of dredging is the more expensive. Nevertheless the Commission believes that dredging, with incidental levee construction, is preferable to the other method on account of the concomitant protection from flood overflow afforded.

The Commission believes that it will be best at this time not to undertake any operations in the lower courses of the Bear and American, but to begin dredging in the navigable portions of the Feather and Sacramento rivers.

That dredging would be the main reliance when it came to the direct improvement of the navigable streams has always been evident. But from the beginning it was believed, and rightly, that it would be hopeless to attempt the improvement of the Feather below Marysville until some successful plan of controlling and fixing the old débris in the Yuba had been devised and applied. That similar treatment would be required for the Bear and American was not equally apparent, and, as pointed out above, investigation and study have shown that barriers and settling basins for the lower reaches of these streams are not

[a] Not printed.

advisable, though dredging or the construction of thoroughly protected training walls may be. These conclusions and the progress of the work of control in the lower Yuba have now made advisable the application of the method of dredging both to the control of the old débris in the Feather and Sacramento and to the improvement of navigation in these streams. It is an important part of the dredging project that the excavated material shall be thrown up into levees along the banks.

It is estimated that $500,000 is the least sum for which a proper system of settling basins can be provided on the American River and $300,000 the least sum for which a similar system can be provided on the Bear River. So far as controlling the débris in the Sacramento and Feather rivers and their tributaries and improving the navigability are concerned, we believe that $800,000 spent in dredging would produce wider and more immediate benefit. In addition, the excavated material, if thrown up into levees along the banks, would do much to control floods.

The sum in question will be sufficient to equip two suction dredges and maintain them in operation for seven months a year for a period of eight years. The total amount of material moved in this time would probably be as much as 15,000,000 cubic yards.

We would not be understood as meaning that levees of a height sufficient to contain the river at extreme flood could be built on both banks along the entire stretch of river in which these dredges would work during these eight years. It will be recalled that the estimate of the Dabney Board for such levees and cut-offs amounted to more than $16,000,000. It would probably be found advisable to confine the work to one bank of the stream, but in any event the material thrown up by these dredges would be placed so as to form a useful part of any work that may be done hereafter by the State in the prosecution of the Dabney or other flood control and reclamation project.

With dredging, the operation of the plan and the results obtained can be ascertained at any time. Emergency work can be done wherever and whenever specially needed, or, in short, dredging offers the most hopeful method of accomplishing débris control, improvement of navigation and levee construction.

Should the application of this method result in restoring the navigable streams to their former condition of depth and flood carrying capacity, hydraulic mining might be permitted under less severe restrictions than now obtain. Whether unrestricted hydraulic mining can ever again be permitted in this watershed will depend on the results obtained. The additional expense for maintenance due to any expansion of hydraulic mining should be borne by a tax on each mine operating.

Many ditches originally constructed for mining are now used for power purposes and accordingly hydraulic mining on its former large scale can not be expected, and the use of water for power will gradually grow more valuable.

The State of California should assist, as it has heretofore done in débris work, by paying one-half the total cost. Furthermore, in order to prevent interruption of work, the rights of way for the levees and spoil banks should be secured before dredging is begun. On account of the benefit to the land protected, these rights of way should be

procured without cost to the Government or State by the reclamation districts concerned, and the donation of said rights of way should be a condition precedent to the expenditure of money for dredging.

Conclusions.—To summarize:

1. We concur in the opinion of our predecessors that dams in the high Sierras are inadvisable on account of cost per cubic yard of storage effected.

2. We believe that for the same reason it is inadvisable to attempt to divert the Yuba, Bear, or American into the "tules" or to construct settling basins or restraining barriers in the lower courses of the Bear or American.

3. We recommend that the Yuba River project be carried to completion, omitting the construction of No. 2 and the reconstruction of barrier No. 1.

4. Of all practicable methods of accomplishing the second of the duties assigned to the Commission, we believe that dredging in the navigable streams and possibly in the lower courses of the principal nonnavigable tributaries is the most feasible and advisable.

It has been urged against the dredging plan that any improvement of the Feather and of the Sacramento above the city of Sacramento will facilitate the progress of flood waters into the river below Sacramento and will therefore raise the flood plane in the lower river. To this the reply is obvious, that whatever work is done on the Sacramento and its tributaries must and will be done upon well-matured plans, in the preparation of which all elements of the problem will be taken into account. The jurisdiction of the Commission is not confined to the Sacramento and its tributaries *above Sacramento*, but extends as well to the river below Sacramento. To quote the act:

> It shall be the duty of said Commission to mature and adopt such plan or plans * * * as will improve the navigability of all the rivers comprising said system (the Sacramento and San Joaquin systems), deepen their channels, and protect their banks. Such plan or plans shall be matured * * * with a view of restoring as near as practicable and the necessities of commerce and navigation demand, the navigability of said rivers to the conditions existing in 1860.

Recommendations.—In pursuance of these conclusions and in compliance with the requirements of the act of March 1, 1893, the Commission recommends as follows:

That for the direct improvement of navigation in the Feather and Sacramento rivers, and toward the controlling of débris and floods, an appropriation of $400,000 be made by Congress, its expenditure to be contingent on the appropriation of an equal amount by the State of California; these sums to be devoted to the construction of two hydraulic dredges and to their operation and maintenance, in accordance with the general terms of this report; provided, furthermore, that all rights of way for levees and spoil banks shall be furnished free of cost to the United States.

Respectfully submitted.

JOHN BIDDLE,
Lieut. Col., Corps of Engineers.
C. H. MCKINSTRY,
Major, Corps of Engineers.
THOS. H. JACKSON,
Captain, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

APPENDIX F F F.

BRIDGES AT WASHINGTON, DISTRICT OF COLUMBIA.

REPORT OF MAJ. SPENCER COSBY, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

1. Repair of the Aqueduct Bridge across Potomac River at Washington, District of Columbia.
2. Highway bridge across the Potomac River at Washington, District of Columbia.

UNITED STATES ENGINEER OFFICE,
Washington, D. C., July 10, 1907.

GENERAL: I have the honor to forward herewith my annual report for the fiscal year ending June 30, 1907, for bridges at Washington, D. C., in my charge.

Very respectfully,

SPENCER COSBY,
Major, Corps of Engineers.

F F F 1.

REPAIR OF THE AQUEDUCT BRIDGE ACROSS THE POTOMAC RIVER AT WASHINGTON, DISTRICT OF COLUMBIA.

WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

(A) RECONSTRUCTION OF PIER NO. 5.

No construction work was done during the fiscal year, the reconstruction of the pier having been completed in December, 1904.

A portion of the balance remaining from the appropriation for reconstruction of the pier was applied to a thorough examination of the masonry work in January, 1907. The portion below water was examined by a diver, who reported that the masonry was in perfect condition and that the base of the pier was practically entirely free from deposits of silt and other materials such as are caught and retained by the riprap protection of the old piers.

The balance remaining from the appropriation being no longer needed for this pier, it was consolidated, under authority of act of Congress approved March 2, 1907, with the balance already available for the periodical examination and repair of the old piers.

Money statement.

July 1, 1906, balance unexpended	$1,612.09
June 30, 1907, amount expended during fiscal year	51.20
July 1, 1907, balance unexpended	[a] 1,560.89

(B) REPAIRS TO REMAINING PIERS.

A thorough examination of all the piers was made by diver in December, 1906, and January, 1907. Pier No. 1 was found to be in very bad condition. The masonry below the water line was much eroded and contained large cavities, caused by the dropping out of one or more face stones. Other large face stones and sections of masonry were found to be loose and about ready to fall. As it was considered impracticable to make satisfactory repairs to the pier, it was recommended that it be torn down and a new pier built in its place. Congress, by act of March 2, 1907, appropriated $80,000 for this purpose.

The other old piers, Nos. 2, 3, 6, 7, and 8, while not in such serious condition as No. 1, were all found to be in need of repairs, the joints being more or less eroded and the masonry containing cavities ranging in size from a few cubic feet to about 1½ cubic yards.

The piers were repaired during April and May, 1907, by filling the cavities with concrete in the manner adopted on previous occasions. Concrete was mixed on a scow, placed in burlap bags of suitable size, and lowered to a diver, who placed the batches in the eroded cavities in the semblance of rough masonry, after having first cleared out the mud and débris. The former repair work done in this manner was reported by the diver to be, in general, in excellent condition.

About 18 cubic yards of concrete were placed in this way, at a total cost for material, labor, and superintendence of $590, or approximately $32.80 per cubic yard. The amount of concrete placed in each pier was as follows:

	Cubic yards.
Pier No. 2	1.80
Pier No. 3	7.69
Pier No. 6	2.70
Pier No. 7	3.64
Pier No. 8	2.17
Total	18.00

The amount expended during the fiscal year for examination of piers and miscellaneous office expenses was $568.

Money statements.

REPAIR TO AQUEDUCT BRIDGE, DISTRICT OF COLUMBIA, EXAMINATION AND REPAIR OF PIERS, ETC.

Amount reappropriated by act approved March 2, 1907	$15,740.77
June 30, 1907, amount expended during fiscal year	687.40
July 1, 1907, balance unexpended	15,053.37
July 1, 1907, outstanding liabilities	44.50
July 1, 1907, balance available	15,008.87

[a] Reappropriated by act of March 2, 1907, consolidated and carried to "Examination and repair of piers, etc."

REPAIR TO AQUEDUCT BRIDGE, DISTRICT OF COLUMBIA, PIER NO. 4.

July 1, 1906, balance unexpended	$12,437.11
June 30, 1907, amount expended during fiscal year	51.20
July 1, 1907, balance unexpended	[a] 12,385.91

REPAIR TO AQUEDUCT BRIDGE, DISTRICT OF COLUMBIA, PIER NO. 4, ETC.

July 1, 1906, balance unexpended	$2,213.37
June 30, 1907, amount expended during fiscal year	419.40
July 1, 1907, balance unexpended	[a] 1,793.97

Submitted in compliance with requirements of sundry civil act of June 14, 1897.

(C) RECONSTRUCTION OF PIER NO. 1.

In addition to the examination made by diver in January, 1907, soundings and probings were made around the pier in May to determine the depth and condition of the bottom. Plans and specifications were prepared and proposals were advertised for on June 21, to be opened July 11.

The upper portion of the new pier, from the bottom of the ice breaker, is to be built practically in the same way as the recently reconstructed pier No. 5, with ashlar facing and concrete backing. The portion below the ice breaker is to be built entirely of concrete, instead of with a facing of ashlar masonry, as was the case at piers Nos. 4 and 5. The pier will be founded on the rock bottom of the river.

F F F 2.

HIGHWAY BRIDGE ACROSS THE POTOMAC RIVER, WASHINGTON, DISTRICT OF COLUMBIA.

WORK OF THE FISCAL YEAR ENDED JUNE 30, 1907.

(A) CONSTRUCTION.

At the beginning of the fiscal year the bridge across the main channel of the river was completed and had been in use for several months. The embankments on its approaches were finished and paved temporarily with macadam. On the Washington approach the permanent drainage system, lighting system, and conduits for telegraph, telephone, light, and power cables had been installed as far as was practicable at that time. On the Virginia approach a permanent and on the Washington approach a temporary overhead trolley system were in operation.

Work had been commenced on the construction of the concrete-steel arch bridge across the Washington channel, and this was approx-

[a] Reappropriated by act of March 2, 1907, consolidated and carried to "Examination and repair of piers, etc."

imately 15.1 per cent completed. The sheet-pile cofferdams for the two piers were in place; all the bearing piles for the south pier and about half of those for the north pier were driven; most of the sheeting for the two abutments was in place and excavation was in progress at both.

Considerable delay was caused at this time and later by the failure to receive promptly the 80-foot piles for the foundations. Although the contractors were urged repeatedly to make every effort to secure these piles on time, the deliveries were slow and pile driving was not entirely completed until about the middle of November.

Numerous unforeseen difficulties were encountered, particularly in working on the foundations of the two abutments, where a large amount of riprap and the remains of old cofferdams used on some former work at these points interfered seriously with the driving of sheeting and making it water-tight. On this account the designs of the two abutments were somewhat modified, with the approval of the Department, in order to facilitate construction.

A sufficient number of piles to finish the driving at the north pier was received in July, and work on the two piers was carried on until early in September, when the concrete of both had reached the elevation of the spring line of the arch, in which condition they were left until the concrete of the abutments could be brought to the same level. This stage was reached about the 1st of December.

Work on the bridge, which should have been finished according to the contract by November 1, progressed slowly in spite of the repeated efforts of this office to hasten it. During the greater part of the work of excavation for the abutment foundations two shifts of men were employed. The contractors were, however, unwilling to do any pile driving at night on account of the supposedly dangerous character of the work. Under the provision of the specifications giving the engineer authority to employ men and use the contractor's plant to put the work in a proper stage of advancement, and after considerable difficulty in finding a suitable foreman willing to undertake the work, a night shift was put on one of the pile drivers by this office during the last part of October. This force was employed for eleven nights, until the supply of piles on hand was exhausted, and the cost of the work was deducted from payments to the contractor.

Although the piers and abutments were practically completed up to the spring line of the arches by the 1st of December, and considerable progress had been made in the erection of centering, none of the steel reinforcing bars for the arches had then been received. About the middle of December the weather became so severe that it was considered inadvisable to start work on the arch rings, and the contractors were required to discontinue concrete work during the winter months, except during a few warm periods when some of the smaller unfinished portions were allowed to be completed.

Work was, however, continued during the winter on the construction of the centering, removal of the upper portion of the old tide gate wing walls, excavation between these and the new abutments, and wherever else work could be done to advantage. The first shipment of the steel reinforcing bars was received about the middle of January, and the blacksmith work necessary to prepare them for placing was started.

During the latter part of January and the greater part of February but little work of any kind was possible on account of the cold and stormy weather.

The contractors were notified that they would be expected to start work on the arch rings on March 18. Although the centering was then ready and the weather was favorable, the beginning of work was delayed by the failure to receive the necessary splices for the reinforcing bars. These were received late in March, were at once put in place, and work was started on the arch rings. Three shifts were employed during most of the time the arch concrete was being placed, and each longitudinal section between skew backs of each span was completed in one continuous operation, the work being carried on simultaneously from the two ends of the arch toward the crown. The centering used was very rigid and strongly braced, and no distortion was noticeable under this method of placing the concrete. The last arch ring section was completed on April 15.

Satisfactory progress was made until May 15, when the contractors were ready to strike the arch centers. Although ample notice had been given the Washington, Alexandria and Mount Vernon Railway Company as to when the bridge would be ready to receive their tracks, and many efforts had been made by the Government to induce them to complete their work promptly, it had not even been started on May 15; it was considered advisable to delay striking the centers until the tracks were put in. The track work was not started until nearly the end of May and proceeded at such a slow rate that it was not until June 17 that it was sufficiently near completion to make the removal of the centering advisable. During this period the bridge contractors were able to do but little work.

On May 17 the wedges were slacked and the removal of the falsework was commenced. Levels taken at this time showed the maximum deflection due to the removal of the supports to be approximately one-eighth of an inch. During the remainder of the month work was resumed on the final trimming up of the concrete faces and on the other unfinished portions of the bridge; all items of construction work were practically completed except the erection of lampposts on the bridge, railings on the new wing walls and tidal gates, and a few minor details.

A contract was made September 11, 1906, for the construction of the permanent paving on both approaches to the main bridge. Work under this contract was completed and the roadways were opened to traffic in December, except on the short sections of approach on each side of the Washington Channel Bridge, which were completed during May and June, 1907, after the bridge was sufficiently near completion to allow of grading its approaches. Granitoid concrete paving was laid for the roadways on both sides of the river. The gutters on the Virginia side are of the same material; those on the Washington side are of vitrified blocks. Concrete curbs were used throughout. A 6-foot brick sidewalk was laid on one side of the Virginia approach roadway, and a 10-foot cement sidewalk on one side of the Washington approach roadway.

On account of the failure of the Washington, Alexandria and Mount Vernon Railway Company to install its conduit tracks on the Washington approach within the time required by law, the permanent curb and gutter construction on the railway side of the approach

could not be put in, and the railway company has been called upon to complete this work without further expense to the United States.

Considerable work was done on both approaches in the way of trimming up and planting the embankment slopes; those on the Washington side were sodded and those on the Virginia side were planted with honeysuckle.

On the Washington approach three flights of reinforced concrete steps were constructed, leading from the roadway to the foot of the embankment.

Railings were erected on the two flights of steps at the north abutment of the main bridge and along each side of the top of the embankment for a short distance. Railings were also erected for a short distance from the bridge on each side of the Virginia embankment.

A contract was entered into on May 8 for the construction of a macadam roadway on the Virginia approach in the space west of the concrete roadway. A portion of this space is occupied by the tracks of the Washington, Alexandria and Mount Vernon Railway Company, and some changes were necessary in the track and overhead construction to meet the requirements of the macadam roadway. On account of the delay of the railway company in making these changes progress on the roadway was slow, but it is now nearly completed.

All items of work in connection with the bridge and approaches are practically completed, with the exception of the work remaining to be done by the Washington, Alexandria and Mount Vernon Railway Company.

It is recommended that both bridges and the approaches, from the north abutment of the Washington Channel Bridge to the southern limit of the Virginia approach, be transferred to the charge of the Office of Public Buildings and Grounds as part of the park system.

At the request of the Engineer Commissioner of the District of Columbia the transfer to the District government of the portion of the approach between the Washington Channel Bridge and the north boundary of Potomac Park was approved by the Secretary of War on June 17, 1907.

Section 12 of the act of Congress approved February 12, 1901, authorizing the construction of the highway bridge and approaches, provides that the cost of the paving between the tracks of the Washington, Alexandria and Mount Vernon Railway Company, and 2 feet outside thereof on the Washington approach, shall be paid by said company. The District of Columbia appropriation act for the fiscal year ending June 30, 1903, provides that the cost of maintaining the pavement of the corresponding space on the highway bridge shall be paid by the street railway company or companies using the same "under such regulations as the Commissioners of the District of Columbia shall prescribe." There is no law requiring the street railway company to pave or maintain the space between its tracks on the Virginia approach, and the cost of this is now paid by the Government.

In order that the law may be the same for all portions of the bridge and approaches, it is recommended that Congress be asked to pass a law requiring the street railway company or companies using the highway bridge and its approaches to pay for and maintain at all times in good condition the paving between the tracks and 2 feet outside thereof on the section or sections used, the paving to be of a

suitable kind approved by the Department of the Government or District of Columbia under whose jurisdiction each section comes.

The amounts disbursed during the fiscal year for the various portions of the work were as follows:

Washington Channel Bridge, $69,560.06; paving Washington approach, $20,713.88; paving Virginia approach, $18,173.53; trimming and planting approach embankments, $2,772.48; constructing railings and concrete steps on approach, $1,939.46; minor additions to main bridge, $1,124.31.

Money statement.

July 1, 1906, balance unexpended	$146,636.76
June 30, 1907, amount expended during fiscal year	114,283.72
July 1, 1907, balance unexpended	32,353.04
July 1, 1907, outstanding liabilities	523.91
July 1, 1907, balance available	31,829.13
July 1, 1907, amount covered by uncompleted contracts	28,016.13

APPROPRIATIONS.

February 12, 1901	$568,000
April 27, 1904	428,000
March 3, 1905	200,000
Total	1,196,000

(B) MAINTENANCE AND OPERATION.

During the fiscal year the bridge was opened 5,138 times for the passage of 5,855 vessels, or an average of approximately 14.08 openings per day. The average cost for current was 8.99 cents per opening.

The machinery of the draw span continued to operate satisfactorily, and but few repairs have been necessary.

Current for operating the draw and lighting the bridge and Washington approach was furnished by contract. During July, 1906, forty-three arc lights were operated on the bridge and nine on the approach. From about August 1 the operation of nine of the lights on the bridge was discontinued. The remaining lights were found to be ample for the illumination of the bridge roadway, and a saving of $765 per annum was effected in this way. Three additional lights were installed on the approach.

Besides the roadway and sidewalk lights on the bridge, three arc lights were erected on posts above the top of the draw-span trusses, to comply with the regulations of the United States Light-House Board. These lights show red up and down stream when the draw is closed and green when it is open. In addition, eight red lanterns, with Fresnal lens globes, were installed at points on the fenders of the draw and rest piers in accordance with the above regulations.

Repairs were made from time to time to the temporary macadam roads of the approaches, which were kept open for the use of light

vehicles until the latter part of September. From then until December 15 they were closed to all traffic, in order to facilitate the construction of the permanent paving; the traffic during this period used the old Long Bridge.

Advantage was taken of this condition to do considerable painting and other repair work on the bridge.

Since December 15 all the traffic formerly using the Long Bridge has crossed the river by way of the Highway Bridge and its approaches.

The concrete roadways of the approaches show some signs of surface wear, but most of this occurred during the first month or so of use. It is thought that as the concrete becomes older the rate of wear will decrease still further. On the whole the paving has proved very satisfactory, being smooth enough to allow it to be cleaned easily and at the same time giving a good foothold to horses.

The average daily travel over the Highway Bridge during August, based on observations taken over a period of seven days, was as follows:

Single cars, 6.7; trains of 2 cars each, 180.1; vehicles (light or unloaded), 540.9; pedestrians, 153; equestrians, 5.6.

The average daily travel during the latter part of June, 1907, was as follows:

Single cars, 40.9; trains of 2 cars each, 213.4; automobiles, 3; double teams, 979.4; single teams, 442.7; pedestrians, 502.7; equestrians, 6.7.

The bulk of the vehicular traffic consists of the two-horse teams going to and from the brickyards in Virginia. There is comparatively little business traffic on Sundays or holidays or during bad weather.

Previous to December 15, three watchmen, with police authority, were employed to regulate traffic on the bridge and preserve order, one watchman being on duty at a time. Owing to the increased traffic, after that date it was considered necessary, in the interest of safety, to employ an additional watchman, in order to have two men on duty during the busiest part of each week day.

The regular force of laborers was also increased at this time from two or three men. These are employed ordinarily only on week days, and their principal duty is to keep the bridge and approach roadways clean.

Previous to February, 1907, two draw operators were employed, working on a day shift of ten hours and a night shift of fourteen hours; the shifts were reversed every two weeks. In order to reduce the time on duty to eight hours per day and also in order to have a third man familiar with the operation and care of the machinery available in case either of the others is unable to be on duty, an additional man was employed in February at a salary considerably less than that of the two regular operators. This man is on duty from 10 p. m. to 6 a. m., the older operators taking the two shifts between 6 a. m. and 10 p. m., when the greatest number of draw openings occur.

Additional labor, superintendence, and inspection were required from time to time in making special repairs and for such items of work as cleaning sewer manholes, removing snow, cutting grass, etc.

The amount saved by reducing the number of lights on the bridge and in other ways was applied to the payment of the additional salaries not otherwise provided for.

While it is believed that the amount appropriated for maintenance and operation for the fiscal year ending June 30, 1908, $16,000, will be sufficient, it will be necessary to revise the apportionment among the various items, as given in the detailed estimate accompanying the last annual report, in order to provide properly for the work. This estimate was made when the bridge had been in operation only a few months, and the present actual requirements could not be accurately anticipated.

The accompanying estimate of expenses for the fiscal year ending June 30, 1909, is based on the present requirements.

Estimate of cost of maintenance and operation for fiscal year ending June 30, 1909.

Salaries:	
2 draw operators, at $1,080 each	$2,160
1 draw operator, at $720	720
4 watchmen, at $600 each	2,400
Labor, for cleaning roadway, etc	1,500
Total for salaries (regular)	6,780
Current for operating 6,000 openings, at 9 cents	540
Lighting 49 arc lights, at $85	4,165
Lighting 20 gas burners, at $20.85	417
Telephone service	63
Fuel for heating operating house	60
Miscellaneous supplies, grease, oil, waste, etc	375
Painting and repairs	2,500
Contingencies (additional labor, etc.)	500
Superintendence and office expense	600
Total	16,000

The disbursements during the fiscal year were as follows:

Outstanding from 1906, for services	$748.95
Supplies and materials for repairs	988.29
Lighting bridge and Washington approach	359.09
Current for operating draw	74.34
Telephone service	5.58
Fuel	3.45
From appropriation for 1907, for services	5,378.13
Supplies and material for repairs	576.41
Lighting bridge and Washington approach	3,421.20
Current for operating draw	403.99
Telephone service	40.17
Fuel	42.00
Office expenses	65.00

Money statements.

MAINTENANCE OF HIGHWAY BRIDGE ACROSS POTOMAC RIVER, DISTRICT OF COLUMBIA, 1906.

July 1, 1906, balance unexpended	$2,280.51
June 30, 1907, amount expended during fiscal year	2,179.70
August 27, 1906, balance unexpended reverted to Treasury	100.81

MAINTENANCE OF HIGHWAY BRIDGE ACROSS POTOMAC RIVER, DISTRICT OF COLUMBIA, 1907.

Amount appropriated by act approved June 27, 1906	$11,600.00
June 30, 1907, amount expended during fiscal year	9,926.90
July 1, 1907, balance unexpended	1,673.10
July 1, 1907, outstanding liabilities	1,181.09
July 1, 1907, balance available	492.01
July 1, 1907, amount covered by uncompleted contracts	385.23
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907	16,000.00

CONTRACTS IN FORCE.

Contractor: Penn Bridge Company, of Beaver Falls, Pa., for constructing concrete-steel arch bridge in approach to highway bridge across Potomac River, District of Columbia.

Date of contract: November 1, 1905.

Approved: December 1, 1905.

Date for commencement: November 1, 1905.

Date for completion: November 1, 1906. (Time for completion of contract waived.)

Rate and amount: For the bridge complete, with all-concrete facing, including excavations for piers and abutments (together with all necessary cofferdams, sheathing, bracing, and pumping to maintain the same), all piles, masonry, concrete work (together with all necessary centers, forms, and false work therefor), steel work, roadway and sidewalk paving, lamps, conduits, etc., and, in fact, everything shown or indicated on the plans or in the specifications, or reasonably implied thereby, as necessary to construct and place the bridge in first-class order, $97,367. For the removal of 550 cubic yards (more or less) of concrete, stone, and timber in the wing walls of the tidal gates and railroad bridge, at $1.50 per cubic yard; for the excavation of 650 cubic yards (more or less) between the wing walls of the tidal gates and the abutments and wing walls of the new bridge, at $2.50 per cubic yard.

The foregoing contract was amended by the following supplemental contract:

Contractor: Penn Bridge Company, of Beaver Falls, Pa., for constructing bridge in approach to highway bridge across Potomac River, District of Columbia.

Date of contract: June 8, 1906.

Approved: June 12, 1906.

Date for commencement: November 1, 1905.

Date for completion: November 1, 1906. (Time for completion of contract waived.)

Rate and amount: For the bridge complete (exclusive of conduit railway construction), including excavations for piers and abutments (together with all necessary cofferdams, sheathing, bracing, and pumping to maintain the same), all piles, masonry, concrete work (together with all necessary centers, forms, and false work therefor), steel work, roadway and sidewalk paving, lamps, ducts, etc., and, in fact, everything shown or indicated on the plans or in the specifications, or reasonably implied thereby, as necessary to construct and place the bridge in first-class order, $84,732. For the construction of the new wing walls between the bridge abutments and tidal gates and construction of concrete steps at each end of tidal gates, including all excavation, sheeting, piling, bracing, forms, and pumping, $4,220. For extending downstream ends of old wing walls, cutting landing steps in old walls, pointing up cracks, cutting and resetting coping, including the furnishing of any additional stone necessary, and coating walls with Portland cement grout, $1,335. For furnishing, erecting, and painting six iron mooring posts in old wing walls, at $10 each. For the removal of 210 cubic yards (more or less) of concrete, stone, and timber in the wing walls of the tidal gates and railroad bridge, at $1.50 per cubic yard. For the

excavation of 270 cubic yards (more or less) between the wing walls of the tidal gates and the abutments and wing walls of the new bridge, at $2.50 per cubic yard. For furnishing and erecting, complete, including posts, and painting 270 feet (more or less) of iron-pipe railing, at $3 per foot. For construction of 420 square yards (more or less) of granolithic paving, including concrete base and preparation of foundation, at $1.25 per square yard. For the removal of 28 (more or less) old piles forming a portion of the old cofferdam used in building the tidal gates, cost of labor and material plus 15 per cent.

And, further, by the following supplemental contract:

Contractor: Penn Bridge Company, of Beaver Falls, Pa., for constructing bridge in approach to highway bridge across Potomac River, District of Columbia.

Date of contract: October 10, 1906.

Approved: October 15, 1906.

That in lieu of constructing the north abutment of the Washington Channel Bridge as provided in the contract dated November 1, 1905, between Lieut. Col. R. L. Hoxie, Corps of Engineers, and the Penn Bridge Company, as modified by supplemental contract dated June 8, 1906, between Capt. Spencer Cosby, Corps of Engineers, and the Penn Bridge Company, the foundation of the said abutment shall be excavated to the depth of about 12½ feet below mean low water, as shown by measurements taken September 28, 1906, and that in consideration of the above change the sum of $1.20 per cubic yard for excavation and $5.50 per cubic yard for concrete omitted shall be deducted from the price named in paragraph 19a of the supplemental contract dated June 8, 1906.

And, further, by the following supplemental contract:

Contractor: Penn Bridge Company, of Beaver Falls, Pa., for constructing bridge in approach to highway bridge across Potomac River, District of Columbia.

Date of contract: May 8, 1907.

Approved: May 27, 1907.

Rate and amount: To substitute for the four bronze electric lamps described in paragraph 72 of the specifications of the contract dated November 1, 1905, four iron lamps of a revised plan; to substitute four granite panels for the four concrete ones in the end posts of the parapet railing; to provide four additional iron lamps and fittings for the intermediate piers of a design approved by the engineer, and at a cost to the contractor not to exceed $650; and to substitute for the asphalt roadway paving, with granite curbs and scoria block gutters, provided in paragraph 69 of the specifications, a granitoid roadway paving, with concrete curbs and vitrified block gutters, to be guaranteed and kept in repair by the contractor or his approved agent without cost to the United States for a period of five years from date of the final voucher. All these modifications shall be made without change in the cost of said bridge.

Contractor: Rudolph S. Blome Company, of Chicago, Ill., for construction of paving, furnishing and setting curb, etc., on approaches to highway bridge across Potomac River, District of Columbia.

Date of contract: September 11, 1906.

Approved: September 19, 1906.

Date for commencement: October 5, 1906.

Date for completion: December 1, 1906. (Time for completion of contract waived.)

WASHINGTON APPROACH.

Rate and amount: Three hundred and fifty cubic yards excavation, at 70 cents per cubic yard; 7,200 square yards Blome Company granitoid concrete blocked roadway paving, including preparation of subgrade, at $1.98 per square yard; 800 square yards vitrified block gutter paving, including 6-inch concrete base and preparation of subgrade, at $1.98 per square yard; 3,250 square yards cement sidewalk, including grading and concrete base, at $1.30 per square yard; 5,450 linear feet concrete curb, including excavation and back filling, at 64 cents per linear foot; 10 catch-basin frames and gratings, furnished and set, including adjustment of concrete walls to proper elevation, at $19 each; 10 manhole frames and covers, furnished and set, including adjustment of concrete walls to proper elevation, at $24 each; 50 linear feet 15-inch terra-cotta drainpipe laid, including excavation and back filling, at $2.90 per linear foot; 20 cubic yards concrete in place in retaining walls at bridge abutment, including excavation, forms, and back filling, at $9.50 per cubic yard; 500 cubic yards bank gravel in place for shaping subgrade, at 90 cents per cubic yard.

VIRGINIA APPROACH.

Six thousand five hundred square yards Blome Company granitoid concrete blocked paving, including preparation of foundation, at $2.07 per square yard; 1,600 square yards brick sidewalk, including excavation and gravel base, at $1.20 per square yard; 4,600 linear feet concrete curb, including excavation and back filling, at 66 cents per linear foot; 16 concrete catch-basins complete, with frames and gratings, including excavation, etc., at $40 each; 200 linear feet 8-inch terra-cotta drainpipe laid, including excavation and back fill, at 80 cents per linear foot; 16 bends for 8-inch pipe, at $2.50 each; 25 cubic yards concrete in place in retaining walls at bridge abutment and in head walls of drainpipes, including excavation, forms, and back filling, at $10.50 per cubic yard; 500 cubic yards bank gravel in place for shaping subgrade, at 90 cents per cubic yard.

Supplemental contract to above contract of September 11, 1906:
Contractor: Rudolph S. Blome Company, of Chicago, Ill.
Date of contract: December 24, 1906.
Approved: January 4, 1907.
Interpreting paragraph 54 of the specifications: to date the five-year guaranty on the 4,400 feet of approaches completed from the date of the final construction voucher for this portion of the work; the five-year guaranty on the remaining 700 feet to date from the date of final construction voucher for that section; also omitting items 6 and 8 of work on the Virginia approach, these items being unnecessary. Work to begin on the unfinished portion on two weeks' notice that this is ready, and be completed in thirty days.

Contractor: Sand, Gravel and Supply Company, of Washington, D. C., for the construction of a macadam roadway on the Virginia approach.
Date of contract: May 8, 1907.
Date for commencement: May 18, 1907.
Date for completion: June 17, 1907. Time for completion of contract waived.
Rate and amount: Four thousand five hundred square yards of macadam roadway paving, including grading and rolling roadbed, at 75 cents per square yard; 2,000 linear feet of concrete gutter, including grading and preparation of foundation, at 60 cents per linear foot; 8 concrete catch-basins, including excavation, back filling, and setting castings, at $10 each; 50 linear feet of 8-inch terra-cotta drainpipe laid, including excavation and back filling, at $1.10 per linear foot; 16 bends 8-inch pipe, at 25 cents each; 8 Y-branches for 8-inch pipe, at 25 cents each; 210 linear feet of concrete curb altered for cross overs, at 30 cents per linear foot.

Contractor: American Street Lighting Company, of Baltimore, Md., for lighting the bridge across Washington channel in approach to Potomac Highway Bridge, District of Columbia, with high candlepower gas lamps.
Date of contract: May 8, 1907.
Approved: May 16, 1907.
Maintenance and service to be continued until June 30, 1908.
Rate and amount: To furnish, maintain, and operate 20 incandescent gas-burners, of not less than 60 candlepower each, on the bridge across Washington channel in the approach to Potomac Highway Bridge, District of Columbia, at $20.85 per burner per year.
Paragraphs 2 and 3 of the specifications are modified as follows: In view of the fact that the globes for the four posts at the entrances to the bridge are of unusual size and must be made specially for these posts, the United States will furnish, in addition to the apparatus mentioned in paragraph 2, one globe on each of the eight posts on the bridge. Any globes which afterwards become damaged or broken through neglect or carelessness of the contractor's employees must be replaced at the expense of the contractor by globes of the same design and quality as the original ones.

Contractor: Potomac Electric Power Company, of Washington, D. C., for furnishing, installing, and maintaining arc lights on the bridge and Washington approach and furnishing power for the operation of the swing span.
Date of contract: July 2, 1906.
Maintenance and service to be continued until June 30, 1907.
Rate: Six cents per kilowatt hour for current for draw span; $85 per lamp *per year* for arc lights.

APPENDIX G G G.

WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA, AND WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA, FILTRATION PLANT.

REPORT OF MAJ. SPENCER COSBY, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

UNITED STATES ENGINEER OFFICE,
Washington, D. C., July 10, 1907.

GENERAL: I have the honor to forward herewith the annual reports for Washington Aqueduct, District of Columbia, and Washington Aqueduct, District of Columbia, Filtration Plant, in my charge, having under my immediate orders First Lieut. Elliott J. Dent, Corps of Engineers.

Very respectfully,

SPENCER COSBY,
Major, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

G G G 1.

WASHINGTON AQUEDUCT.

The following operations were conducted during the fiscal year under the appropriation made for the maintenance and repair of the Washington Aqueduct and those parts of the water-supply system of the District of Columbia that are under the supervision of the Chief of Engineers.

GATEHOUSES, BUILDINGS, AND GROUNDS.

Gatehouses and buildings were repaired, painted, and whitewashed where necessary. Machinery was tested and maintained in good condition. All grounds were kept in good order.

DALECARLIA RESERVOIR.

The defects in this reservoir were discussed in the Annual Report of the Chief of Engineers for 1906, pages 2087 and 2088. To remedy these, appropriations were passed at the last session of Congress for

the purchase of a dredge, for removal of the accumulated sediment by dredging, and for riprapping the sides of the reservoir. Proposals for a 10-inch hydraulic dredge were opened June 13, 1907. None of the appropriations become available until the beginning of the next fiscal year.

DISTRIBUTING RESERVOIR.

The wooden picket fence on the side of this reservoir next to the Conduit road was repaired and whitewashed. The remainder of this fence will be replaced early in the coming fiscal year by a woven-wire fence, supported by pipe posts. Some work on the posts has already been done.

WASHINGTON CITY RESERVOIR.

Some work was done during the year toward trimming up the grounds around this reservoir. Their incorporation with the filtration plant to form McMillan Park makes it desirable that they be properly parked. An appropriation of $3,000 was made by Congress and will be applied to this purpose during the coming fiscal year.

It is estimated that this amount will be sufficient to grade and seed the portion of the grounds adjoining the reservoir. The area south of the dam is in a very rough and unsightly condition and should be graded, seeded with grass, and ornamented with trees and shrubs. An estimate of $6,000 is submitted for this purpose. A comprehensive plan for this work is in course of preparation, and when completed a more detailed estimate will be drawn up. It is believed that the above sum will be sufficient to put this portion of the grounds in sightly condition. The roads in the park should eventually be macadamized, which will require further appropriations.

THE CONDUIT.

The feeder at Great Falls was cleaned in October, 1906, and again in May, 1907. About 200 cubic yards of mud were removed at each cleaning, at a cost of $34.18.

In December, 1906, the tunnel between the Georgetown and Washington City reservoirs was partially pumped out. An inspection in the vicinity of Rock Creek shaft showed that part of the tunnel to be in excellent condition, except that a quantity of plaster had fallen from the side walls. This plaster is in thin sheets and, while its absence leaves the surfaces of the side walls somewhat rough, it is not essential and need not be replaced. A comprehensive plan for draining and thoroughly cleaning the tunnel was prepared, on the basis of the experience obtained, and this work will be done during the coming fiscal year.

THE CONDUIT ROAD.

The quarry opened up during the latter part of the fiscal year 1906 was kept in operation until the entire section, about 3 miles long, from the Anglers' Association clubhouse to bridge No. 3, had been put in good repair. About 3,400 cubic yards of broken stone were placed on this section of the road during the fiscal year, at a cost of $5,907.25. On other sections of the road ditches were cleaned, weeds cut, and minor repairs made to the roadway and fences.

THE BRIDGES.

During October, 1906, a new floor was laid on the Pennsylvania Avenue Bridge across Rock Creek, at a cost of $552.01. Two thicknesses of plank were used, the lower being laid diagonally and treated with a liquid wood preservative. The wooden bridge at Dalecarlia Reservoir had so far deteriorated that it was considered necessary to replace it. A concrete culvert was accordingly built in its place, and an earth fill above it to carry the roadway is nearly completed. The cost of this work so far is $2,124.54.

THE MAINS.

Prior to August, 1905, the mains leading from the distributing reservoir were used for a gravity supply to the city. On August 21, 1905, the gates at the distributing reservoir were closed, and since that date the entire supply has passed through the tunnel to the Washington City reservoir. The mains are now more than ever before an integral part of the city distribution system.

By mutual agreement they are now operated and maintained by the city water department. It is recommended that their formal transfer to the city be authorized.

TURBIDITIES.

The practice of closing the inlet gates at Great Falls whenever the turbidity of the Potomac water reaches 500 or more, as described in the Annual Report of the Chief of Engineers for 1906, pages 2090 and 2091, was continued during the fiscal year with the results shown in the following table, which are of course only approximate.

TABLE No. 1.—*Table showing tons of suspended matter entering the system, etc.*

	Amount that would have entered the system if the gates had been left continuously open.	Number of hours gates were closed.	Amount shut out.	Amount deposited in Dalecarlia Reservoir.	Amount deposited in Georgetown Reservoir.	Amount deposited in Washington City Reservoir.	Amount entering Filtration Plant.	Total.
July	930	35	315	168	32	19	191	725
August	2,700	176	1,300	942	210	93	197	2,742
September	246	0	0	17	25	14	109	165
October	900	72	672	170	58	13	94	1,007
November	155	0	0	45	15	13	53	126
December	409	24	134	169	12	9	110	434
January	825	0	0	515	0	95	231	841
February	158	0	0	62	0	0	73	135
March	1,650	144	1,150	350	30	55	235	1,820
April	262	0	0	103	11	24	95	233
May	164	0	0	64	12	23	37	136
June	58	0	0	26	6	6	7	45
Total	8,457	451	3,571	2,631	411	364	1,432	8,409

From the above it is seen that the gates were closed 5 per cent of the time, thereby excluding 42 per cent of the total suspended matter that would otherwise have entered the system.

HOUSE AT GREAT FALLS.

During times of high water it is necessary to have some one continuously on watch day and night at the intake at Great Falls. A section of the conduit, the road, and the telephone line 5 miles in length just below Great Falls is patrolled daily and kept in repair. In order to attend properly to this work it is essential that the watchman at Great Falls have a competent assistant, capable in case of necessity of performing the duties of the watchman. Due to the isolation of the locality and the fact that no dwelling house is available it has been found impossible to get a satisfactory man to move from a distance to accept the position of assistant. Although several men living in the vicinity have been tried it has not been possible to secure a competent man from among them.

A suitable site for a house is already owned by the United States, and in order to end the present unsatisfactory conditions it is recommended that an appropriation of $3,000 be made immediately available for the construction of a substantial stone or brick dwelling house at Great Falls, Md.

STOREHOUSE AND STABLE AT GREAT FALLS, MD.

For use on the Great Falls division of the conduit there is on hand a supply of tools and appliances, a large proportion of which are stored in temporary sheds or left in the open where they deteriorate rapidly. The watchman at Great Falls owns a private horse and buggy, which are frequently used on public business, but for which he receives no compensation.

An estimate of $3,000 is submitted for construction of a substantial stone or brick storehouse and stable. The present structures are so dilapidated that it would be a waste of money to attempt to repair them.

CONSUMPTION AND WASTE OF WATER.

Tables showing the consumption and waste of water per twenty-four hours by months from July, 1899, to June, 1906, and by years from 1874 to 1906, will be found in the Annual Report of the Chief of Engineers for 1906, page 2092. The following table covers the fiscal year 1907, and the diagram plate No. 1, gives a graphical comparison with the consumption for previous years since 1899:

Table showing average consumption and waste of water for twenty-four hours, July, 1906–June, 1907.

	Million gallons.
July	69.18
August	68.03
September	69.82
October	69.14
November	65.51
December	65.71
January	67.62
February	74.68
March	64.23
April	63.45
May	62.47
June	63.53
Average	66.90

Population, police census 1907, 329,591.

Average per capita consumption July 1, 1906–June 30, 1907, 203 gallons.

The maximum consumption for any day during the year was 80.29 million gallons on February 16, 1907.

The slight diminution in the total and the per capita consumption of water for the fiscal year 1907, as compared with the previous year, should probably be attributed to the systematic crusade against waste conducted by the District of Columbia water department. It may also to some extent have been due to the better quality of the water supplied. During the hot portion of the year the daily consumption showed a high average with slight fluctuations. During the winter fluctuations of 25 per cent in forty-eight hours took place and the maximum daily consumption occurred during a spell of cold weather. In the cool spring months the fluctuations were slight and the average consumption was the lowest for the year.

In the Annual Report for 1906, it was stated that, taking into consideration the fluctuations which experience shows will occur, 65,000,000 gallons per day is the greatest annual average quantity of water that the system can be safely counted upon to supply. The average for the past year was slightly above this figure. It is only reasonable to expect that weather conditions similar to those existing during January and February, 1905, will recur and result, as then, in an abnormally great use of water. The accompanying diagram, plate No. 1, shows graphically the relation between the actual consumption and waste and the capacity of the system as stated in the Annual Report for 1906. During February, 1905, the average consumption and waste for thirteen consecutive days was greater than what Mr. Hazen considered to be "the extreme capacity of the system which can be reached for a short time." Mr. Hazen's figures took into consideration the new factors introduced by the filtration plant which was not in operation during February, 1905. Since his computations were made new condensers have been installed in the discharges to the main pumps at the filtration plant and this has to some extent increased their capacity. The probable number of days during which an output of 95,000,000 gallons per day could be maintained has been increased. The maximum daily output is limited by the capacity of the conduit and has not been increased. Attention is again invited to this serious condition, and three possible remedies are suggested below:

First. Reduce the present constant waste.

It is believed that a per capita supply of 120 gallons per day is more than ample for the present needs of this city.

In 11 cities, the data for which are in hand, 90 per cent of the services are metered and the average per capita consumption is 64 gallons per day. In only one case is the per capita consumption above 100 gallons per day. It is believed that by universal metering and charging for water according to the quantity used the daily consumption and waste in the District of Columbia can be reduced to 120 gallons per capita, or a total of about 40,000,000 gallons per day with the present population, and that the cost to the average consumer would be less than under the present wasteful conditions. Only 11 per cent of the services are now metered, though this will be increased to about 20 per cent by the end of the fiscal year 1908.

Second. Obtain *a new and independent* supply.

The arguments in favor of this course are set forth in the Annual Report of the Chief of Engineers for 1905, page 2613. Such a work will require time and money. It should be preceded by a thorough and careful investigation of all possible sources and routes of supply. An investigation at this time will be of value, whether the work is undertaken at once or not. To make the necessary preliminary investigations and surveys an estimate of $10,000 is again submitted.

Third. Install one or more booster pumps along the line of the Washington Aqueduct to increase the flow while maintaining the supply in the reservoirs.

This method should be considered only as an expedient to tide over an emergency. It would not materially increase the extreme capacity of the system, but would make it possible to deliver the full 95,000,000 gallons per day for an indefinite time.

EMERGENCY FUND.

In the past estimates have been submitted to cover only actual maintenance expenses and improvements. When a break or other contingency occurred, necessitating any unlooked-for expenditure, it was necessary to stop ordinary operations so as to cover the extraordinary expense. Should, however, a serious break occur during the last part of the fiscal year, the funds available might be inadequate and a disastrous condition result. An appropriation of $5,000 is recommended to constitute an emergency fund, to be used only in case of a serious break, requiring immediate repair, in one of the important aqueduct or filtration plant structures, such as a dam, conduit, tunnel, bridge, building, or important piece of machinery, all expenditures from this appropriation to be reported in detail to Congress.

Appropriations made for the Washington Aqueduct, with the dates of acts for the same.

Date.	Amount.	Date.	Amount.	Date.	Amount.
September 30, 1850	$500	June 23, 1874[d]	$36,400	July 14, 1892	$20,000
August 31, 1852[a]	5,000	March 3, 1875	26,000	March 3, 1893	80,000
March 3, 1853	100,000	July 31, 1876	22,000	August 7, 1894[m]	82,500
March 3, 1855	250,000	March 3, 1877	15,000	March 2, 1895[n]	71,500
August 18, 1856	250,000	June 20, 1878	15,000	June 11, 1896[o]	25,000
March 3, 1857	1,000,000	March 3, 1879[e]	20,000	March 3, 1897[p]	26,000
June 12, 1858	800,000	June 4, 1880[f]	20,000	June 30, 1898	22,000
June 25, 1860	500,000	March 3, 1881	20,000	March 3, 1899	25,000
July 4, 1864	150,000	July 1, 1882[g]	20,000	June 6, 1900[q]	37,000
July 28, 1866	142,584	March 3, 1883	20,000	March 1, 1901	22,000
December 20, 1866	12,000	July 5, 1884	20,000	July 1, 1902	33,000
March 2, 1867	20,000	February 25, 1885	20,000	March 3, 1903	33,000
July 25, 1868	52,500	July 9, 1886	20,000	April 27, 1904	33,000
March 3, 1869	25,000	March 3, 1887	20,000	March 3, 1905	33,000
July 15, 1870[b]	120,822	July 18, 1888[h]	20,000	June 27, 1906[r]	33,000
March 3, 1871	114,196	March 2, 1889[i]	20,000	March 2, 1907	102,000
June 10, 1872	70,555	August 6, 1890[j]	25,500		
January 23, 1873	14,000	March 3, 1891[k]	20,000	Total	4,728,657
March 3, 1873[c]	43,600				

NOTE.—Reverted to the Treasury: ([a]) $2.81, ([b]) $46.25, ([c]) $560.87, ([d]) 35 cents, ([e]) $109.87, ([f]) $381.06, ([g]) $1,354.17, ([h]) $2,266.34, ([i]) $4.12, ([j]) $5.50, ([k]) $2.49, ([m]) $39.96, ([n]) $2,983.87, ([o]) $285.85, ([p]) $1,828.53, $4.38 from regular appropriation for Washington Aqueduct, $1,824.15 from appropriation for constructing telephone line, ([q]) $1,450.02 from appropriations for protection to inlet at Great Falls and repairing by-conduit; and ([r]) $32.46 total, $17,849.02. Since 1878 one half of the amounts appropriated has been contributed by the United States and the other half by the District of Columbia.

Money statements.

WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA, 1906.

July 1, 1906, balance unexpended	$2,245.57
June 30, 1907, amount expended during fiscal year	2,213.11
December 10, 1906, balance unexpended, reverted to Treasury	32.46

WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA, 1907.

Amount appropriated by act approved June 27, 1906	$33,000.00
June 30, 1907, amount expended during fiscal year	29,274.88
July 1, 1907, balance unexpended	3,725.12
July 1, 1907, outstanding liabilities	3,568.53
July 1, 1907, balance to revert to Treasury	156.59

G G G 2.

WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA, FILTRATION PLANT.

(A) CONSTRUCTION.

The Washington Filtration Plant had been practically completed before the beginning of the present fiscal year. During the year no new contracts were entered into and the disbursements made were mainly retained percentages and final payments on outstanding contracts.

A storehouse for supplies and appliances of all kinds was built during the year by day labor at a cost of $4,990.88. An experimental filtration plant, fully described in the report of "Maintenance and Operation," was built at a cost of $3,307.35. Some minor improvements in roads, grading, etc, were made.

The contract with the Brennan Construction Company, approved April 15, 1903, was closed during September, 1906. The work done under this contract consisted in the completion of the piping and plumbing awarded these contractors as extra work.

The contract with the Babcock & Wilcox Company for boilers, mechanical stokers, etc., for the pumping plant, approved June 10, 1903, was closed by payment of the percentage retained until one year after the completion of the capacity and duty trials.

The contract with the Brennan Construction Company, approved June 23, 1905, for ducts and manholes of the electric-lighting system was closed during August, 1906. The only work during the fiscal year under this contract consisted in finishing the tops of a few manholes.

The work under contract approved July 10, 1905, with the National Electrical Supply Company for lamps and wiring was completed before the beginning of the fiscal year. The contract was closed during July, 1906, by final payment.

The contract with the Rudolph S. Blome Company, approved August 16, 1905, for constructing 29 concrete sand bins was closed during January, 1907. The only work done under this contract during the fiscal year consisted in stopping small leaks in several sand bins.

The contract for delivering cement with the National Mortar Company, dated March 1, 1906, was closed during September, 1906, by final payment. No deliveries were made during the fiscal year under this contract.

The tests of the main pumps and engines installed by Henry R. Worthington under contract approved June 17, 1903, showed them to be slightly below the guaranteed standard of efficiency as reported in Annual Report of the Chief of Engineers for 1906, page 2097. New condensers were installed during the fiscal year and the guaranteed efficiency was attained. The only work remaining to be done under this contract consists in painting and furnishing a few minor tools, etc.

The necessity for completing the plant by the construction of works for preliminary treatment of the water is briefly discussed under the head of "Maintenance and Operation."

AMOUNTS AND DATES OF APPROPRIATIONS FOR THE WORK

June 6, 1900	$200,000	March 3, 1903	$600,000
March 1, 1901	500,000	April 27, 1904	1,568,155
July 1, 1902	600,000		
July 1, 1902 (deficiency)	250	Total	3,468,400

Abstract of contracts.

Name.	Rate.	Date of approval.	Date of expiration.
Brennan Construction Co.:			
Steel-pipe system, lump sum	$72,800.00	Apr. 15, 1903	Dec. 1, 1904 [a]
Cast-iron pipe, lump sum	75,000.00		
Sand-washer system, lump sum	24,000.00		
Pressure-pipe system, lump sum	1,200.00		
Exterior-drainage system and manholes, lump sum	25,000.00		
Central underdrains in filters, per linear foot	1.65		
Interior-drainage system, per filter	500.00		
Excavation, per cubic yard	.30	Dec. 26, 1905	Do.[a]
Granolithic pavement, per square yard	.90		
Henry R. Worthington:			
Main pumping engines, each	14,000.00	June 17, 1903	Do.[a]
Pumping engines, sand-washing, each	4,060.00		
Babcock & Wilcox Co.:			
Boilers, each	3,669.75	June 10, 1903	Do.[a]
Mechanical stokers, each	1,034.50		
Economizers, each	2,523.00		
The Brennan Construction Co.: Electric-lighting plant, Class C, lump sum	7,554.00	June 23, 1905	Sept. 23, 1905 [a]
National Electrical Supply Co.: Electric-lighting plant, Class D, lump sum	30,935.00	July 10, 1905	Oct. 10, 1905 [a]
Rudolph S. Blome Co., for concrete steel sand bins, lump sum	48,838.00	Aug. 16, 1905	Nov. 1, 1905 [a]
National Mortar Co., for Old Dominion cement, net per barrel	1.59	(b)	June 30, 1906

[a] Time limit for completion of contract waived. [b] Emergency.

Money statement.

July 1, 1906, balance unexpended	$112,929.36
Amount reverted from "Maintenance and Operation" April 30, 1907	21,539.78
	134,469.14
June 30, 1907, amount expended during fiscal year	66,555.35
July 1, 1907, balance unexpended	67,913.79
July 1, 1907, outstanding liabilities	1,149.52
July 1, 1907, balance available	66,764.27
July 1, 1907, amount covered by uncompleted contracts	11,674.61

(B) MAINTENANCE AND OPERATION.

A general description of the filtration plant was given in Appendix D D D 2, pages 2101 to 2103, of the Annual Report of the Chief of Engineers for 1906.

The maximum, minimum, and average turbidities of the samples of water tested during the year are shown in the following table:

TABLE No. 1.

TURBIDITIES.

[United States Geological Survey standard.]

	Great Falls.	Dalecarlia reservoir outlet.	Georgetown reservoir outlet.	Washington City reservoir outlet.	Filtered water reservoir.
Maximum	1,530	250	150	[a] 250	13
Minimum	9	7	8	6	0+
Average	114	46	37	29	2

[a] Turbidity on July 1, 1906.

The turbidity of the water applied to the filters exceeded 50 on sixty-four days during the year; it exceeded 100 on only ten days.

A series of observations on the appearance of filtered water having different degrees of turbidity indicated that when viewed in a clear tumbler or carafe against a dark background, a turbidity of 1 destroys the brilliancy of the water. In an ordinary drinking glass a turbidity of 2 is noticeable and one of 6 is decidedly objectionable.

The record of daily observations shows that the turbidity of the filtered water was one or more for 49 per cent, two or more for 19 per cent, and six or more for 12 per cent of the year.

From the above it is obvious that the effluent from the filters, i. e., the city water, has been unsatisfactory as to clearness for a large part of the year.

While it is true that the small amount of turbidity in the city water does not affect its quality from a sanitary standpoint, it is also true that just as long as it exists brilliant looking spring or well waters will be used by some people in preference to the city supply.

These waters may be safe or otherwise; their purity can not, however, be judged from their appearance. A protest from the inhabitants of the vicinity is made practically every time a public well is closed, even though its insanitary and dangerous condition may have been established beyond a reasonable doubt. As long as the filtered water continues to show periods of turbidity, it will be difficult to establish public confidence in it.

An experimental filtration plant has been built and operated since February 7, 1907, for the purpose of ascertaining the best practicable method of clarifying the water. The results obtained are given in some detail in another part of this report. They show that as yet we have failed to find any system of simple filtration which promises to give satisfactory results.

Neither double nor triple filtration removes the exceedingly fine particles of clay which remain after the first filtration. The most practicable method so far found appears to be the use of a coagulant

for a part of the time, and the experimental work indicates that by this means the water supplied to the consumers may be made as clear and sparkling as spring water.

The cost of coagulation can not be definitely estimated from the data now at hand, and it is believed advisable to wait for the result of a full year's tests before making any recommendation on this subject.

Bacteria.—Daily analyses have been made of samples of water taken at Dalecarlia reservoir inlet (which are believed to represent fairly the river water at Great Falls); at the outlet of this reservoir; at Georgetown reservoir outlet; at Washington City reservoir outlet; in the filtered water reservoir, and from each of the filters in operation. Samples from taps in various parts of the city are taken and tested once each week. All samples are tested by standard methods, and the number of bacteria per cubic centimeter in each determined. In addition to this work many tests are made for the colon bacillus.

The results of this work are summarized in the following table:

TABLE No. 2.

(A) BACTERIA PER CUBIC CENTIMETER.

	Dalecarlia reservoir.		Georgetown reservoir outlet.	Washington City reservoir outlet.	Filtered water reservoir.
	Inlet.	Outlet.			
Maximum	63,000	24,000	23,000	15,000	200
Minimum	70	50	30	36	4
Average	4,852	1,938	1,685	633	31

TABLE No. 2.

(B) SUMMARY OF RESULTS OF TESTS FOR BACILLUS COLI.

	Cubic centimeters.	Total samples examined.	Number positive.	Percentage positive.
Great Falls or Dalecarlia inlet	10	156	96	61
	1	156	68	44
	1 10	156	30	19
Dalecarlia outlet	10	130	75	58
	1	130	38	29
	1 10	130	16	12
Georgetown reservoir	10	131	67	51
	1	131	39	30
	1 10	131	14	11
Washington City reservoir (applied water)	10	292	95	33
	1	292	38	13
	1 10	292	4	1
Filtered water reservoir	10	292	13	4
	1	292	6	2
Tap water from various parts of city	10	523	28	5
	1	523	5	1

Some of the more important results of the filter and pumping station operations and of the sanitary analyses, as well as typhoid statistics, etc., are given in the following tables:

TABLE No. 3.

(A) SUMMARY OF TOTAL COST OF OPERATION.

	Labor.	Materials.	Total.
Office and laboratory	$14,006.17	$656.82	$14,662.99
Pumping station	13,923.83	16,391.75	30,315.58
Filter operation	20,912.28	7,366.58	28,278.86
Experimental filters	716.65	33.28	749.93
Main office	956.00	56.66	1,012.66
Total	50,514.93	24,505.09	75,020.02

Amount of work done.

Quantity of water pumped to filters	million gallons	24,417.73
Quantity of water pumped to sand washers	do	134.60
Number of filters cleaned		97.76
Amount of sand scraped	cubic yards	25,689
Amount of sand washed from storage piles	do	8,211
Total amount of sand washed	do	33,900
Amount of sand replaced in filters	do	34,781

(B) COST PER MILLION GALLONS FILTERED.

	Labor.	Materials.	Total.
Office and laboratory	$0.57	$0.03	$0.60
Pumping station	.57	.67	1.24
Operating filters	.86	.30	1.16
Experimental filters	.03	.....	.03
Main office	.04	.....	.04
Total	2.07	1.00	3.07

TABLE No. 4.

FILTER RUNS, OR PERIODS OF OPERATIONS BETWEEN CLEANINGS.

	Duration in days.	Million gallons filtered.	Sand removed.	Depth of scraping.
			Cu. yds.	*Inches.*
Maximum	199	466.12	536	4.00
Minimum	30	101.53	52	.39
Average	75	217.78	261	1.95

TABLE No. 5.

PUMPING STATION (AVERAGE DAILY RESULTS).

	Million gallons pumped—		Lift to filters.	Pressure at sand-washer pump per square inch.	Coal consumed.	Station duty per 100 pounds of coal consumed.
	To filters.	To sand washers.				
			Feet.	*Pounds.*	*Tons.*	
Maximum	80.29	2.12	26.1	130.0	15	71.6
Minimum	57.18	.023	20.2	110.0	7	46.5
Average	66.89	.58	21.6	120.8	10	68.8

TABLE No. 6.

SUMMARY OF SANITARY CHEMICAL ANALYSES OF WEEKLY SAMPLES.

[Results given in parts per million.]

	Turbidity.	Nitrogen as ammonia.			Nitrogen as—		Hardness.	Alkalinity.	Chlorine.
		Free.	Albuminoid.	Total.	Nitrites.	Nitrates.			
Dalecarlia inlet	147	0.030	0.204	0.234	0.0030	0.93	62	54	2.1
Dalecarlia outlet	52	.032	.158	.190	.0035	.98	64	56	2.1
Georgetown reservoir outlet	44	.019	.114	.133	.0039	1.04	64	56	2.0
Washington City reservoir outlet	31	.017	.083	.100	.0034	1.05	62	54	1.7
Filtered water reservoir	3	.013	.058	.071	.0001	1.08	63	54	1.8

TABLE No. 7.

(A) TABLE SHOWING NUMBER OF DEATHS FROM TYPHOID FEVER, BY MONTHS, IN THE DISTRICT OF COLUMBIA FOR THE ELEVEN FISCAL YEARS PRECEDING THE DATE OF THIS REPORT.

	1896 and 1897.	1897 and 1898.	1898 and 1899.	1899 and 1900.	1900 and 1901.	1901 and 1902.	1902 and 1903.	1903 and 1904.	1904 and 1905.	1905 and 1906.	1906 and 1907.	Monthly averages.
July	8	10	24	9	20	16	21	17	16	15	21	16.1
August	15	16	22	38	41	33	39	26	22	30	32	28.5
September	25	18	22	30	29	28	25	18	25	23	21	24.0
October	25	10	28	28	25	21	32	19	14	26	25	23.0
November	18	9	21	27	28	22	19	8	11	14	17	17.6
December	16	18	16	26	17	16	20	14	9	6	4	14.7
January	13	8	10	17	7	19	9	5	11	6	7	10.2
February	4	4	4	6	2	8	5	5	1	4	6	4.5
March	4	2	7	8	8	12	9	6	5	5	4	6.3
April	4	9	6	10	2	9	6	10	7	4	6	6.6
May	6	6	3	5	4	13	6	8	1	10	7	6.3
June	9	20	6	12	10	9	3	8	3	9	2	8.3
Total	147	130	169	216	193	206	194	144	125	152	152	.....

(B) PRECEDING TABLE OF TYPHOID DEATHS REDUCED TO DEATH RATES PER 100,000 INHABITANTS PER YEAR.

	1896 and 1897.	1897 and 1898.	1898 and 1899.	1899 and 1900.	1900 and 1901.	1901 and 1902.	1902 and 1903.	1903 and 1904.	1904 and 1905.	1905 and 1906.	1906 and 1907.	Average monthly death rate.
July	35	43	102	37	82	64	83	66	61	56	69	63.4
August	65	69	93	158	167	132	153	100	83	111	105	112.3
September	109	78	93	125	118	112	98	69	95	85	69	95.5
October	109	43	19	116	102	84	126	73	53	97	82	91.2
November	78	39	89	112	114	88	75	31	42	52	56	70.5
December	70	78	68	108	69	64	79	54	34	22	13	59.8
January	56	34	42	69	28	75	35	19	41	22	24	40.4
February	17	17		24	8	31	19	19	4	15	20	17.3
March	17	8	29	33	32	47	35	23	19	18	13	24.9
April	17	38	25	41	8	35	23	38	26	15	20	26.0
May	26	25	12	20	16	51	23	30	4	36	24	23.4
June	39	85	25	49	40	35	12	30	11	33	7	33.3
Annual death rate	53	46	59	74	65	68	63	46	39	47	42	.....

Experimental filters.—In order to determine as far as possible the best method of securing a clear-water supply at all times and under all conditions, an experimental filter plant was built at Dalecarlia reservoir. It comprises three systems of filtration, viz:

System A, which consists of a rapid and a slow sand filter; system B, which consists of a Maignen scrubber and a slow sand filter; and

system C, consisting of a settling or coagulating basin and a slow sand filter.

Systems A and B represent the two most promising systems of double filtration known to this office. In each the water is first filtered through the rapid sand filter or scrubber and then through the slow sand filter operated in connection with it. The object is to remove the greater part of the mud and bacteria in the preliminary filter, and so leave only a comparatively small amount of work to be done by the slow sand filter, which is expected to complete the work in a satisfactory manner. In other words, these two systems represent the most approved methods of treating a rather difficult water without the use of a coagulant.

System C represents the modified slow sand system now coming into use in Europe and takes a position midway between the slow sand and the mechanical system. An ordinary slow sand filter is operated in the usual manner in connection with a large settling basin. At times when the raw water is too turbid to be satisfactorily clarified by the filter alone, a coagulant is applied at the entrance of the settling basin. This is of such a capacity that ample time is given the coagulant to do its work thoroughly, so that practically all of the coagulated material settles to the bottom of the basin. In this way the filter does all the work as long as it is able to do it satisfactorily. When, however, the water becomes too turbid, a part of the turbidity is removed by the coagulant, and the small amount which remains is so changed in character that it is readily and completely removed by the filter.

The rapid sand filter and the Maignen scrubbers in the experimental plant are cylindrical concrete steel tanks 4 feet in diameter and 10 feet in height. The three slow sand filters are of similar shape and construction but are 10 feet in diameter and 9.5 feet in height. The settling basin is of concrete construction and is 10 feet wide, 29 feet long, and 6 feet high. With the exception of the settling basin the plant is inclosed by a frame building containing stoves, so that the temperature can always be kept above the freezing point.

Each of the three slow sand filters contains 1 foot of broken stone in three layers, the first or lower layer being 7 inches in thickness and of stones varying from 1 to 2 inches in diameter, the second is 2½ inches in thickness and of stones varying between three-eighths and 1 inch in diameter, and the top layer is 2½ inches thick and of stones varying between coarse sand and three-eighths inch in diameter. Above the upper layer of broken stone is placed 3 feet of filter sand taken from that used in the large filters of the Washington Filtration Plant. The whole arrangement is a reproduction on a small scale of the Washington filters.

The rapid sand filter contains 6 inches of broken stone in two layers, corresponding to the intermediate and upper layers in the slow sand filters, and 3 feet of the same grade of filter sand.

The Maignen scrubber contains 1 foot of cobblestone varying in size between 2 and 5 inches; 1 foot of coke, egg size; 1 foot of coke, stove size; 2 feet of coke, nut size, and 2 feet of sponge clippings.

Both the rapid sand filter and the Maignen scrubber are located on a platform above the slow sand filters, in order that their effluents may be readily applied to the latter.

Each filter is provided with the necessary valves, meters, and piping for operating it, measuring its rate of filtration, loss of head, etc.

In addition to the above, two small experimental slow sand filters have been installed at the filtration plant office. These are so placed that the effluent from one is carried to the other and again filtered. The first one is supplied with filtered water from the city mains, so that the water passing through them actually receives a triple filtration. Since it falls in a thin stream as it enters each filter it is twice aerated.

The experimental filters at Dalecarlia reservoir have been operated since February 8 and those at the filtration plant office since April, 1907.

A brief summary of a part of the results obtained is shown in the following table:

TABLE No. 8.

EXPERIMENTAL FILTER PLANT.

	Nominal rate of filtration (million gallons per acre-day).	Turbidity.		Bacteria.	
		Influent.	Effluent.	Influent.	Effluent.
SYSTEM A.					
Hill scrubber:					
Maximum	.....	140	27	14,000	1,700
Minimum	.....	10	1	100	6
Average	50	33	6	1,150	92
Slow sand filter:					
Maximum	.....	27	3	1,700	75
Minimum	.....	1	1	6	7
Average	4	6	1	92	34
SYSTEM B.					
Maignen scrubber:					
Maximum	.....	130	45	14,000	2,900
Minimum	.....	10	1	130	12
Average	50	32	8	1,190	252
Slow sand filter:					
Maximum	.....	45	4	2,900	140
Minimum	.....	1	1	12	6
Average	4	8	1	252	31
SYSTEM C.					
Coagulating basin:					
Maximum	.....	140	46	14,000	8,000
Minimum	.....	10	5	100	50
Average	.....	32	15	1,160	1,170
Slow sand filter:					
Maximum	.....	46	1	8,000	150
Minimum	.....	5	0	50	8
Average	3	15	0+	1,170	35

Up to the present time no combination of filters has been found which has satisfactorily clarified the Potomac water. While the preliminary filters remove the greater part of the suspended matter and leave comparatively little work for the slow sand filter to do, the grains of mud remaining in the water after the first filtration are so exceedingly small that they are not entirely removed by either a second or third filtration.

In order to arrest these fine grains a layer of very finely powdered animal charcoal was applied to the surface of the slow sand filter of system B, but without any apparent success.

The results from system C (the modified slow sand system) show, *however*, that it has so far been successful in keeping the water free

at all times of turbidity by the occasional use of a coagulant and subsequent filtration.

The experience thus far gained with this system indicates that it will be found to be the most practical method of clarifying the Potomac water at a reasonable cost and at the same time utilizing the plant already installed.

The bulk of the mud is not only removed by coagulation, but the small amount which remains is so changed in character that it can readily be removed by filtration. It also tends to form a sticky gelatinous mass on the top of the filter sand which assists in arresting particles of mud in the applied water for several days after the use of the coagulant has ceased.

Sand washing experiments.—Considerable experimental work has been done, in order to ascertain the most effective and economical method of washing and handling sand with the apparatus installed at the time the plant was built.

The washers are of the ejector type, each having two hoppers, and the sand was originally washed in the first hopper, carried over to the second, where it was again washed, and finally led to a large cylindrical concrete storage bin.

After some experimenting it was found that one washing is sufficient, and that the sand bin plays quite an important part in the process. Its principal defect, when considered as a washer, is due to the fact that a large body of dirty water remains on top of the sand when work is suspended. During the time that washing is in progress a mixture of sand and water is carried from the hopper of the washer to the bin. The sand, being the heaviest part of this mixture, rapidly settles to the bottom of the bin, leaving the dirty water above it. This water escapes through an overflow situated several feet above the level of the sand. As long as work is in progress the fine particles of mud or clay in the water are kept in suspension. When work is stopped, however, these fine particles gradually settle and are deposited on the sand surface, forming a thin layer of mud.

After some experimenting a practicable means was found of draining the water from above the sand and thus preventing the deposition of the suspended mud.

One of the bins has already been fitted with the necessary drain pipes, and steps have been taken to install them on the others. This will enable one of the hoppers of the sand washer to be cut out, and thus a considerable saving in wash water will be effected. In fact, if the hopper were not needed as a booster to elevate the sand to the bin no washers other than the bin would ordinarily be required.

With one hopper in service about twelve volumes of water are required at a pressure of 100 pounds per square inch to wash and elevate one volume of sand to the bin, a distance of about 30 feet.

Another improvement was made in the form of the injector tips and ejector throats. These parts are made of cast iron and wore out rapidly, having an average life of only two to four days when used in the form given them by the maker. By changing the interior contours of the injector tips their life was increased over ten times, and by inserting a piece of gas pipe as a lining in the ejector throats their life is prolonged indefinitely.

Sand handling experiments.—A large number of experiments were conducted during the year to determine the most economical and expeditious methods of handling sand with the apparatus available.

In the process of cleaning the filters about 30,000 cubic yards of sand are annually removed from them, washed, and returned to them. The efficiency of the sand handling and washing devices plays an important part in determining the total cost of operation.

When a filter is cleaned the dirty layer of sand is shoveled into piles, and from these into portable ejectors. From the latter it is carried by a jet of water through one or more lengths of fire hose to the fixed piping and on to the washers and sand bins. The amount of sand taken from a filter is determined by the depth of the scraping. Experience has shown that it is not necessary to remove all of the discolored sand, and a considerable saving will hereafter be effected by reducing the depth of scraping.

As a result of the experiments with the ejector a nozzle about 0.75 inch and a throat about 1.5 to 1.75 inches in diameter will probably be adopted. The capacity of an ejector has been about doubled and its economy has been greatly increased.

AMOUNT AND DATE OF APPROPRIATIONS FOR THE WORK.

	Appropriated.	Reverted to appropriation or to Treasury.
March 2, 1905 (allotment)	$70,000.00	$21,539.78
June 27, 1906	80,000.00	.....
March 2, 1907	90,000.00	692.74
Total	240,000.00	.....

Abstract of contract in force.

Contractor: Margaretha Johnson, executrix, for bituminous coal.
Date of contract: August 10, 1906.
Approved: August 17, 1906.
Date of commencement: Within thirty days from notification.
Date for completion: Before July 1, 1907.
Amount and rate: Furnishing and delivering 4,800 tons bituminous coal, at $3.43 per ton.

Money statements.

WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA FILTRATION PLANT, MAINTENANCE AND OPERATION.

July 1, 1906, balance unexpended	$28,421.98
June 30, 1907, amount expended during fiscal year	6,882.20
July 1, 1907, balance unexpended, reverted to Washington Aqueduct, District of Columbia, filtration plant, construction, April 30, 1907	21,539.78

MAINTENANCE, WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA FILTRATION PLANT, 1907.

Amount appropriated by act approved June 27, 1906	$80,000.00
June 30, 1907, amount expended during fiscal year	70,833.28
July 1, 1907, balance unexpended	9,166.72
July 1, 1907, outstanding liabilities	5,974.23
July 1, 1907, balance available	3,192.49
July 1, 1907, amount covered by uncompleted contracts	2,499.75

APPENDIX H H H.

IMPROVEMENT AND CARE OF PUBLIC BUILDINGS AND GROUNDS IN THE DISTRICT OF COLUMBIA—WASHINGTON MONUMENT.

REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 1907. OFFICER IN CHARGE, COL. CHAS. S. BROMWELL, U. S. ARMY.

CONTENTS.

	Page.
A. Public buildings:	
1. Executive Mansion, ordinary care, repair, etc	2301
2. Office building for the President	2304
3. Executive Mansion stables	2304
4. Stable, Office Public Buildings and Grounds	2305
5. Executive Mansion greenhouses	2305
6. Executive Mansion grounds	2305
7. Executive Mansion, extraordinary repairs	2306
8. House where Abraham Lincoln died	2309
9. Ford's Theater building	2309
10. Buildings occupied as offices by the War Department	2309
11. House No. 204 L street NW	2310
B. Washington Monument:	
1. General report	2310
2. Data	2311
C. Public reservations in the District of Columbia:	
1. General remarks	2312
2. Classification of work	2312
3. Reservations added to park system during year	2313
4. Reservations separated from park system during year	2313
5. Reservations improved during the year	2313
Tables	2314
6. Park curbing	2315
7. Park watchmen (policemen)	2315
8. Table of arrests during the year	2318
9. Childrens' playgrounds	2318
10. Maintenance of improved parks	2319
11. Northwest division	2319
12. Southwest division	2325
13. Potomac Park:	
Macadam roadway on north and west sides of tidal reservoir	2327
Macadam roadway along river side of sections 1 and 2	2328
14. East division	2329
15. Grounds of Library of Congress	2331
16. Grounds of Capitol	2331
17. Band concerts	2332
D. Propagating Gardens:	
1. General remarks	2333
2. List of stock propagated, purchased, and distributed	2334
3. Shops building	2334
E. Miscellaneous	2335

	Page.
F. Water pipes and fountains	2336
G. Lighting the public grounds	2336
H. Asphalt pavements	2337
I. Statues:	
1. General remarks	2337
2. Memorial to General Grant	2338
3. Statue of General McClellan	2338
4. Statue of General Sheridan	2339
5. Monument to General Count Pulaski	2340
6. Statue of General Baron von Steuben	2340
7. Statue of General Thaddeus Kosciuszko	2340
8. Statue of Thomas Jefferson	2340
9. Statue of John Paul Jones	2341
10. Statue of Commodore John Barry	2341
11. Statue of Longfellow	2341
12. Memorial to Christopher Columbus	2341
K. Departmental telegraph	2342
L. Old records of Washington City	2343
M. Extensions to buildings in Washington	2343
N. Reservations occupied contrary to law	2344
O. Monument and wharf at Wakefield, Va	2344
P. United States wharf property in Washington	2344
Q. Summary of work done during the year	2345
R. Estimates	2348
S. Explanation of estimates	2352
T. Financial statement	2356
U. Inventory of property in Executive Mansion	2358

PHOTOGRAPHS.

1. Basin drive, Potomac Park, from the inlet	2328
2. Basin drive, Potomac Park, from the curve	2328
3. McClellan statue, as completed	2338
4. McClellan statue unveiling, 5 views	2338

OFFICE OF PUBLIC BUILDINGS AND GROUNDS,
Washington, July 20, 1907.

GENERAL: I have the honor to submit the following report of operations upon public buildings and grounds in the District of Columbia under the Chief of Engineers during the fiscal year ending June 30, 1907:

Besides the care of public buildings and grounds and the Washington Monument, this Office has also been charged with additional duties, as follows:

1. The preservation, care, and safety of buildings occupied by the War Department in the District of Columbia, except the State, War, and Navy Departments building.

2. The care and repair of the Government telegraph line connecting the Capitol with the various Departments and with the Government Printing Office.

3. The immediate charge of the banks of the Potomac River from the north line of the arsenal (or Washington Barracks) grounds to the southern curb line of N street SW.

4. Care of the building on Tenth street NW. where Abraham Lincoln died.

5. Such matters connected with the erection of the statue of General Sherman as may properly devolve upon the War Department.

6. The monument at Wakefield, Va., the birthplace of Washington, and the iron pile dock at the mouth of Bridge Creek, Virginia.

7. The erection in the national military park at Gettysburg, Pa., of a memorial tablet to Abraham Lincoln.

8. Executive and disbursing officer of the Sheridan Statue Commission.

9. Since March 6, 1901, executive and disbursing officer of the Grant Statue or Memorial Commission.

10. Since May 4, 1901, the same for McClellan Statue Commission.

11. Since August 11, 1901, in charge of the portion of Potomac Park between the tidal reservoir and the Washington Monument grounds, and between Seventeenth street and Virginia avenue NW., and Maryland avenue and Fourteenth street SW., called hereafter Monument Park Annex; since November 25, 1903, of the portion between the Virginia channel of the Potomac River, the tidal reservoir, and the causeway of the Pennsylvania Railroad bridge; since June 11, 1906, in charge of the portion between the tidal reservoir and the sewer canal; and since April 4, 1907, in charge of a strip of section 1 of Potomac Park about 165 feet wide adjacent to sea wall on Potomac River side and extending from the mouth of the Seventeenth street sewer canal northwestwardly to the mouth of the Easbys Point sewer at foot of Twenty-third street NW.

12. Since July 26, 1902, in charge of the erection of a monument at Fredericksburg, Va., to the memory of Gen. Hugh Mercer.

13. Since December 17, 1903, executive and disbursing officer of the Pulaski Statue Commission, and of the Von Steuben Statue Commission.

14. Since May 6, 1904, executive and disbursing officer of the Jefferson Statue Commission.

15. Since June 22, 1906, executive and disbursing officer of the Barry Statue Commission.

16. Since December 24, 1906, executive and disbursing officer of the Longfellow Statue Commission and executive officer of the Kosciuszko Statue Commission.

17. Since May 18, 1907, executive and disbursing officer of the Columbus Memorial Commission.

ORDINARY CARE, REPAIR, AND REFURNISHING OF THE EXECUTIVE MANSION.

Diplomatic Assembly Room, ground floor.—The walls, ceiling, and woodwork were painted.

Diplomatic Ladies' Cloak Room, ground floor.—The walls, ceiling, and woodwork were painted.

Congressional Ladies' Cloak Room, ground floor.—The walls, ceiling, and woodwork were painted.

Electricians' room, ground floor.—The walls were touched up and painted.

Toilet rooms, ground floor.—The ceiling, walls, and woodwork were touched up and painted.

Steward's Room, ground floor.—A steam radiator was placed in position and connected.

Guard Room, East Terrace.—The floor was varnished.

Carridor, ground floor.—Portions of the wall were touched up and painted.

Entrance to elevator, ground floor.—The door and door frame and glass doors were painted.

Service stairway.—The walls from the ground floor to the second floor and the iron railing and iron work of the stairway from the ground floor to the attic were painted.

The entrance vestibule.—The old paint was burned from the windows and they were painted.

The Private Dining Room.—The ceiling was cleaned off and painted, the old paint was burned from the woodwork and it was repainted; the walls were repainted and the hard-wood floors cleaned and varnished.

The State Dining Room.—Portions of the sashes were painted and stained.

The butler's pantry.—Portions of the woodwork were painted. A steam radiator was placed in position and connected with the steam pipes on first floor.

Main corridor, first floor.—The walls were touched up and painted.

Elevator landing, first floor.—The door frames were painted.

Main stairway.—The walls were touched up and painted.

Hard-wood floors.—Those in the East Room, Ushers' Room, first floor, and in the elevator car were filled and shellacked.

Large northwest bedroom.—The ceiling was washed off and repaired, covered with muslin, and painted. The walls were cleaned and painted, the hard-wood doors cleaned and varnished and parts of the mirror frames regilded.

Room east of above.—The ceiling was cleaned off, pointed up, sized, and painted; walls, woodwork and window scerens painted, and hard-wood doors cleaned and varnished.

Large southwest bedroom.—The ceiling was cleaned off, covered with muslin, and painted; the walls and woodwork painted; the hardwood doors cleaned and varnished and parts of the mirror frame regilded. The woodwork and ceiling of the passageway leading into southwest dressing room were painted.

Room west of Library.—The ceiling was scraped, repaired, covered with muslin, and painted. The walls, woodwork, and window screens were painted; the hard-wood doors cleaned and varnished, and parts of the mirror frame regilded. The walls and woodwork of adjoining bathroom were also painted.

Room east of Library.—The ceiling was cleaned off, pointed up, sized, covered with muslin, and painted. The old paint was burned off from the woodwork, and it and the window screens were painted. The hard-wood doors were cleaned and varnished.

Corridor, second floor.—The ceiling from the east end to the west end was cleaned off, sized, covered with muslin and painted. The burlap on the walls at east and west end was retinted in dark green to its original color. All the woodwork from the main stairway at the east end to the west end was painted.

Alcove Hall, second floor.—The ceiling was cleaned, covered with muslin, and painted.

Room east of Alcove Hall.—The ceiling was cleaned off, pointed up, sized, covered with muslin, and painted. The woodwork and window screens were painted and the hard-wood doors cleaned and varnished.

Passageway to elevator, second floor.—The walls and woodwork were painted and the hard-wood doors cleaned and varnished.

Southeast bathroom, second floor.—Work was commenced in June, 1907, for retiling this room. The plumbing fixtures were taken out, the tile removed and placed in condition for retiling.

Exterior of Mansion.—In August, 1906, the exterior walls were washed off and the top cornice tuoched up in spots where the paint had chipped off. In September places on the walls where the old paint had chipped were painted and the coping around the north portico was also painted. In June, 1907, work was commenced for repainting the entire exterior, and by the close of the month the old paint had been burned off from about three-fourths of the north front and the surface given a priming coat. Work was also commenced scraping the balustrade around the roof and burning off the old paint from the south portico and giving it a priming coat.

Plumbing, heating, and lighting.—Increased facilities for washing down the exterior of the Mansion were provided by running 550 feet of 1¼-inch galvanized iron pipe around the roof balustrade and placing 14 valves on the pipe at intervals for attaching hose. Necessary attention was paid to the plumbing fixtures during the year, minor repairs made as required, and the large water filters regularly cleaned and maintained in good order. The 5-inch rain leader under the floor of the attic was fastened up with iron hangers wherever found insecure.

Radiators and pipes for hot-water heating were installed in two workrooms and in a small passageway in the west end of the west terrace, and connected with the heating boiler in the basement of the Executive Office building. Necessary attention was given to the entire heating plant, and it was maintained in efficient working order.

Attention was paid to the lighting system, minor repairs made, and burned out electric lamps replaced with new lamps. A defective section of the main lighting cable leading in from the dynamos in the State, War, and Navy Departments building was cut out and replaced with new cable. Chandeliers and other lighting fixtures were cleaned. Gas was run into the guardroom at the east end of East Terrace.

Carpentry, glazing, etc.—Minor carpentry repairs were made, doors eased, locks repaired, and keys fitted. Some repairs were made about the elevator, and the dumb waiter from kitchen to butler's pantry was overhauled and put in good order. Broken glass in windows throughout the Mansion was replaced with new glass.

Furniture and furnishings.—The furniture was cared for, cleaned, and slight repairs made where needed. In the autumn carpets were relaid, lace curtains and window and door draperies were rehung, and the house put in order for the winter. In May, 1907, carpets were taken up, cleaned, and stored at the storehouse on Monument grounds, window and door draperies taken down, cleaned and packed away in boxes, and window awnings put up.

Social functions.—The work devolving upon this Office in connection with these functions was performed in December, 1906, January and February, 1907. These functions were: One tea, three dinners, one day reception, four night receptions, and two evening musicales. For the night receptions the furniture was removed from the rooms on the drawing-room floor and attendants provided for the hat and cloak boxes and the dressing rooms on the ground floor. This latter

was also done for the musicales, and in addition chairs placed in the East Room for the guests. For the dinners the tables were placed in position, and the usual floral decorations provided. After all of these functions the house was restored to its usual condition. For use at the night functions an electric carriage call was placed upon the roof of the East Terrace, and two sets of telephones, with necessary connections, put up temporarily for calling carriages at the south entrance. These were all removed when no longer needed.

Inventory of property.—Sundry civil act approved April 17, 1900 (vol. 31, p. 97), provides:

And hereafter a complete inventory, in proper books, shall be made annually by the steward, under the direction of the officer in charge of public buildings and grounds, of all the public property in and belonging to the Executive Mansion, showing when purchased, use to which applied, cost, condition, and final disposition, to be submitted to Congress with annual report of officer in charge of public buildings and grounds.

In compliance with this law an inventory has been made and is submitted with this report as Appendix A. It shows the total quantity of property on hand at the close of the fiscal year ending June 30, 1906, the quantity purchased during the year, what was disposed of during that period, and the total quantity on hand June 30, 1907.

Executive office building.—The hot-water faucets in the toilet rooms were connected with the laundry boiler in the West Terrace, in order that there might be a supply of hot water at all times. The hot-water boiler in the basement, which formerly supplied these fixtures in the winter months only, was removed. The hard-wood floors in some of the rooms were filled and shellacked. The large water filter in basement was disconnected and removed, being no longer needed, since the city water supply is already filtered before it reaches the supply pipes. Some of the door frames, doors, slat doors, washboards, and one mantelpiece were painted. Repairs were made to the windows. A hot-water boiler was placed in the basement and all necessary connections made. The plumbing and lighting fixtures were maintained in good order and some minor carpentry repairs made. Leaks in the roof were repaired. The attic room was rewired, so that the electric lights therein may be distributed where required. The asphalt pavement at the north front of the building was repaired, the area resurfaced amounting to about 20 square yards.

Stable of Executive Mansion.—In the stall rooms on north and south sides the old floors and floor joists were taken up, new joists put down, and a new double floor laid. All new work was painted. The old waste pipes were removed from the south side of the stable, and a new watering trough placed and connected with drainage system. The sink in kitchen of living rooms on second floor was connected with new waste. A new valve and pipe were placed for flushing the trough in the rear of the stable, and the new troughs on either side of the building were connected with sewer. The watering tank on north side of stable was reset. The plumbing fixtures were maintained in good order during the year, minor repairs having been made as required. The hall way between the two stall rooms, the base of the brick wall in the harness room, the two kitchens, the pantry, bathroom, and the entrance to kitchens were all painted, and the stained woodwork in the latter rooms was touched up and var-

nished. Broken window glass was replaced with new glass. Portions of the iron fence at the front of the stable were scraped in June, 1907, preparatory to painting it.

Stable of Public Buildings and Grounds.—Minor repairs were made to the plumbing and to the gas fixtures.

Greenhouses, Executive Mansion.—These houses are located at the Propagating Gardens on the Monument grounds. Necessary care was extended to the collection of plants, and they were maintained in good condition. Decayed woodwork of plant benches and other parts of the houses was torn out and replaced with new materials and painted. Other necessary painting was done and broken glass replaced with new glass. Heating boilers were overhauled, repairs made, and flue pipes cleaned. The dirt floor of the bay-tree house was lowered 12 inches by excavation, brick piers built under the center posts supporting the roof, a brick and cement gutter with sewer trap laid along the interior of the south wall, and new guttering put up on the north side. Two old boilers were removed from the furnace room under potting shed, and replaced with a new boiler, which was connected with flow and return pipes. In the two new rose houses the wooden purlins were replaced with galvanized-iron pipe, supported on iron-pipe posts. Braces were placed across the west end of the houses to make the roofs and sides more rigid. The old rustic siding was removed from these houses, that which was in good condition painted on the outside surface and with necessary new material replaced on the sides and ends of the houses. The grounds between and around the houses were maintained in a cleanly condition.

Grounds of the Executive Mansion.—These grounds were maintained in good condition. Lawns were mown, roads, walks, sidewalk pavements, gutters, and drain traps cleaned. The macadam roadway at north front was repaired with crushed stone as required, and the gravel roads in the south grounds were repaired with fresh gravel. Bare places on lawns were loosened up and seeded. Two large Norway maples were planted in the south grounds. Three hundred and ten cart loads of manure were spread over the lawns in December and raked in in May and the refuse removed. The shrubs and beds of plants were mulched with manure.

In the Colonial Gardens south of the East and West terraces the grass was cut, gravel walks rolled, cobble-stone gutters cleaned, and 14 feet of them taken up and relaid, hedges trimmed, climbing roses and vines tied, dead and broken limbs removed from trees and shrubs. In the late autumn the bay trees on the roofs of the East and West terraces were taken down, hauled to the Propagating Gardens, and placed in the bay tree house for the winter. Their places on the terraces were filled during the winter and early spring months with evergreen trees in tubs and boxes, which were hauled from the Propagating Gardens for the purpose.

In accordance with usual custom the grounds were opened to the children on Easter Monday, April 1, 1907, from 9 o'clock a. m. until 1 o'clock p. m. for the "egg rolling." After the grounds were closed they were cleaned up and the rubbish removed. The cost of this extra cleaning, and the work which was done in putting up the wire protection for the shrubbery, etc., amounted to about $20.

EXTRAORDINARY REPAIRS, EXECUTIVE MANSION.

In sundry civil act for the fiscal year ending June 30, 1907, approved June 30, 1906, Congress appropriated the sum of $35,000 for "extraordinary repairs of the Executive Mansion." Under that appropriation the following work was done:

The East Room.—All the old paint was removed, the ceiling painted with four coats of paint, and the woodwork with four coats of paint and two of enamel. The window cornices, mirror frames, frames of furniture, and the console tables regilded, the furniture reupholstered and re-covered, and new draperies hung at the windows. This work was done under contract.

The Green Room.—The frames of the furniture were refinished, and it was reupholstered and re-covered with new material. One screen was regilded. All under contract.

The Blue Room.—The ceiling and cornice were washed off, the former covered with muslin, and both painted with three coats of paint. All the old paint was cleaned from the woodwork, which was then given four coats of paint and two coats of enamel. All of the woodwork that had been gilded was regilded and the doors refinished. The old rep covering was removed from the walls and replaced with new covering of same material. New window draperies of blue rep were hung and the furniture was reupholstered and re-covered with new material. All under contract. The work of completing this room was delayed into the winter on account of delay in getting the materials for the walls and draperies. This had to be made at the mill and then embroidered by hand.

The Red Room.—The ceiling was washed off and painted and the old paint was burned off from the woodwork. It was then shellacked, sandpapered, and painted. The hardwood doors were cleaned and varnished. The old covering was removed from the walls and they were covered with new silk velour. The frames of the furniture were refinished, and it was reupholstered and re-covered with new material. All of this work except painting was under contract.

The entrance vestibule, main corridor, and ushers' room.—The frames of the two large mirrors were regilded, the frames of the divan window seats refinished, and the seats reupholstered and re-covered with new materials, and four new window draperies and four new door draperies purchased and hung. All under contract.

The East Terrace.—Alterations were made in the hat and coat box corridor in this terrace to better adapt it to the needs of guests at functions. The old middle doorway exit from the corridor to the colonnade on the south side was bricked up and closed and four new doorways into the colonnade cut through the wall and doors hung. The alterations in the cloak boxes in the corridor necessitated by this change were made. Wooden and glass partitions made to be removable at will were set between the columns on the south side of the colonnade to make it a closed passageway for use by guests in winter to pass from the coat corridor into the corridor on the ground floor of the Mansion, and thus avoid the congestion hitherto incident to a large crowd of persons in the cloak corridor. All of the new woodwork and the brick floor of colonnade were painted. Four steam radiators were placed in the long colonnade on south side and the necessary pipe connections made between them and the heating

system of the Mansion. Eleven sash frames for ventilating the colonnade were made, hung, and painted. At the main entrance to the terrace the false wooden beams in the ceilings which divided them into panels were found to be rotting away, caused by water leaking through the roof of the terrace. These beams and the wire lathing and plastering around them were taken down and replaced with frames made of steel angles and riveted bands which were secured to the overhead hollow terra cotta arches with bolts. Galvanized wire mesh was bent around this framework and secured with copper wire to support the new plaster. The other old plastering of the ceiling that had been damaged by the water was also removed and all replaced with new plastering. A new cove moulding of plaster was run around all the ceiling panels and along the entire length of the colonnade of the south side of terrace. The plastering in the lobby at west end of the terrace was repaired where damaged from same cause and the ceilings and walls painted.

The cloak corridor, the colonnade, and the lobby at entrance to the terrace were all repainted. The guards' room was painted and the floor stained. The exterior of the East Terrace was also painted.

The East Terrace roof.—Owing to the many leaks in the old cement covering of this roof, it was necessary to take it off and replace it with a new covering. A contract was accordingly entered into on July 26, 1906, for placing upon it a new covering of hydrolithic construction. The new roof when completed was found to be not perfectly water-tight, and the contractor immediately offered to make it so at his own expense by taking off the covering and replacing it. As the family were then in the house, the work could not be done at that time and had to be postponed until the summer of 1907, when the house would be again vacant. In the meantime all payments due the contractor were held up until a satisfactory job was made. All of the old electric-light wiring in the old original roof covering, which supplied the lights in the East Terrace rooms and hat-box corridor, and which had become largely useless by the many leaks in the old roof, was removed when the latter was taken off, and new pipe conduits and wires run in other locations in those apartments. The cables connecting with the mains were placed in pipe conduits under the floor of the cloak corridor and the wires properly run for the various lights. The distributing panel board was also placed in a new and better location. The standards for the lights on the roof of the terrace were also reset and reconnected. The contractor for the roof covering commenced operations in the latter part of June, 1907, for replacing his work.

The West Terrace roof.—As the old cement covering on this roof also leaked, a contract was entered into on September 14, 1906, for replacing it with a new covering of hydrolithic construction, similar to that on the East Terrace and with the same contractors. Work was immediately commenced and satisfactorily completed in October. This terrace also had to be rewired for the electric lights, and the work was done in a most substantial manner. The electric-light standards on the roof were taken down, replaced when the new roof covering was completed, and connected with the new feed wires.

The roof of Mansion.—The old tin covering was removed from the roof and a new tin covering put on. The work was done in August and September under *contract*. It was delayed by heavy rains. In

order to prevent the attic from being flooded during storms, only so much of the old tin covering was taken off each day as could be replaced with the new covering. Two layers of rosin-sized building paper were placed under the new tin plates as they were laid. Great care was exercised in selecting a brand of tin for the work, and after careful tests the brand submitted by the lowest bidder was accepted. His work was entirely satisfactory. Three ventilators were put in position and the entire roof painted with three coats of paint. A wooden slat walk was placed where walking is necessary, in order to protect the new roof. The tank house was also covered with tin. The chimneys, skylights, ventilators, stone coping, and the new slat walk were painted. In March, 1907, an additional wooden walk was laid in the valley of the roof.

Fire protection.—Work for installing additional fire protection was commenced in August and completed in November. This protection consists of four lines of 3-inch galvanized-iron pipes extending from the ground floor to the attic floor, two up the chimney on the east end of the Mansion, and two up the chimney on the west end of the Mansion. The pipes were run through the wall of the house from the north area to the chimneys, and up them to a point between the ceiling of the second story and the floor of the attic. Here they were brought through the chimneys and attached to a system of perforated 1¼-inch pipes laid under the attic floor, through which water can be flooded when needed. These 1¼-inch pipes are perforated their entire length with $\frac{3}{16}$-inch holes, which are drilled four in every 5 inches of length of pipe. In the north area way the four 3-inch pipes extend 6 inches above the pavement, and to each of these four outlets a 3-inch Siamese-twin hose coupling was attached, which are the outside termini of the system, and to which the hose from the fire engines will be connected in case of fire. In the work mentioned, 1,227 feet of 3-inch pipe and 3,405 feet of 1¼-inch pipe were used. In addition to the foregoing, two of the latest improved fire hydrants were placed at the south front of the Mansion on the roadway southeast and southwest of the house. To supply these hydrants 348 feet of 6-inch cast-iron pressure pipe and 60 feet of 4-inch cast-iron pressure pipe were run to them from the 4-inch water main in the grounds.

The porticoes.—The old tile floor on the south portico, which had become very uneven, was taken up and relaid on a concrete base. Six new stones were used to replace a like number of old stones that were damaged in raising. The old flagging pavement of the north portico was taken up and replaced with a new pavement of Indiana limestone. This new floor covers an area of 960 square feet. The work on both porticoes was done under contract. Some of the old stone steps of the north portico were redressed.

New pavement, north area.—Under contract dated August 18 the old pavement, consisting of a tar pavement on a brick base, was taken up, the bed prepared, a concrete base 6 inches thick laid, an asphalt binder course 1½ inches thick after rolling laid, and upon this an asphalt wearing surface 1½ inches thick after rolling placed. The new pavement covers the entire north area and extends under the north portico. The work was practically completed by August 31.

Cement walk at south front.—Under contract of September 10 the old asphalt footwalk at the south front of the Mansion was taken

up and a cement concrete walk laid in its place. A cement coping was laid along the edge of the walk. The work was completed within one week from date of contract.

HOUSE NO. 516 TENTH STREET NW., WHERE ABRAHAM LINCOLN DIED.

This property was purchased by the United States in November, 1896, since which date it has been under the supervision of this Office.

By authority of the Secretary of War, dated October 9, 1899, Mr. O. H. Oldroyd is allowed to occupy this building with his family as custodian, without pay, and to exhibit his Lincoln Museum and to charge a small entrance fee therefor.

The following repairs were made to this building during the year:

The walls and ceiling of the halls and the back room on second floor were repapered. Repairs were made to the heating apparatus and to the plumbing. A heating coil was removed from one of the bedrooms and broken window glass was replaced with new glass.

A partition on first floor of rear building was moved out 2½ feet, and minor repairs made to woodwork.

FORD'S THEATER BUILDING.

By order of the War Department, dated April 18, 1906, I was charged with the work of removing an old unserviceable boiler from the basement of this building and replacing it with a new boiler. Bids were at once invited, opened on May 22, and a contract entered into June 7, 1906. Work was commenced almost immediately by the contractor for the removal of the old boiler, and by June 30 all the necessary alterations in the masonry work had been completed, the new boiler had arrived and was ready to be set. During July, 1906, the old boiler was taken out and hauled to the storage grounds of this office on the Monument grounds. The new boiler was taken into the building and set on the foundation constructed in June, and all necessary brickwork completed. The small transverse arch in front of the boiler was widened 2 feet to give additional room for handling firing tools, and a new arch turned over the enlarged opening. The old brick floor in front of the boiler was taken up and a new one put down, well grouted with cement. The flues and dampers were properly connected, all pipe work and boiler trimmings completed, and the boiler left ready to fire.

BUILDINGS OCCUPIED AS OFFICES BY THE WAR DEPARTMENT, EXCEPT STATE, WAR, AND NAVY DEPARTMENT BUILDING.

By order of the War Department, dated June 30, 1893, all buildings occupied as offices by the War Department, except the State, War, and Navy Departments building, were placed under the charge of this Office, so far as their preservation, care, and safety are concerned. Between July 1, 1906, and June 30, 1907, the buildings thus occupied were twelve in number, as follows:

Army Medical Museum and Library, Seventh and B streets SW.
Ford's Theater building, 509–511 Tenth street NW.
No. 610 Seventeenth street NW., Adjutant-General's Office, War Department.
No. 532 Seventeenth street NW., office depot quartermaster, United States Army, and photograph gallery, office Chief of Staff.

No. 1725 F street NW., branch printing office, War Department.
No. 1712 G street NW., publication branch, Adjutant-General's Office, War Department.
No. 1744 G street NW., Board of Ordnance and Fortification, Signal Office, etc.
No. 1720 H street NW., Medical Dispensary, United States Army.
Annex to Winder Building, Ordnance Department, United States Army.
War Department stables, G street, between Seventeenth and Eighteenth streets NW.
Lemon Building, No. 1729 New York avenue NW., occupied by Division of Military Information of General Staff, Supply Division, War Department, etc.
No. 1800 F street NW., occupied as an annex to the Insular Bureau of the War Department.

Monthly inspections have been made of these buildings during the year, and they are believed to be in good and safe condition for the purposes for which they are being used. A special inspection of the water-closets in the Army Medical Museum and Library building was made in January, 1907, and a report made to the Department in regard to them on January 25.

HOUSE NO. 204 L STREET, NW.

This property escheated to the United States in December, 1904, and came under the charge of the Chief of Engineers in pursuance of section 1797, Revised Statutes, as amended by the act of April 28, 1902, volume 32, Statutes, page 152. By act approved June 30, 1906, the Chief of Engineers was authorized to sell the property at auction to the highest bidder, provided such highest bid was considered reasonable and just. The property was accordingly advertised for sale in the usual way and on November 28, 1906, was sold at auction to the highest bidder for the sum of $1,210, which was considered a satisfactory price. The net proceeds of the sale were deposited in the Treasury in accordance with law.

THE WASHINGTON NATIONAL MONUMENT.

The usual care was extended to maintain the Monument and its machinery in good condition and to keep the interior of the shaft clean. The iron stairway and landings were swept, and the tablets dusted, when necessary. The Monument was open to visitors every day except Sundays and holidays, and the elevator was in operation on the days the Monument was open except during the first week in January, 1907, when two equalizing steel arms for the elevator cables were being put in position.

Only one arrest was made during the year—in September, 1906—of a visitor who was caught defacing the Monument. He was taken to the police court, where he was fined $50.

The elevator and its machinery were inspected once each month by an agent of the Casualty Company, with whom an agreement is in force for that service. In addition, the machinery was examined, oiled, and cleaned each day by the employees at the Monument before starting to carry passengers, and twice each week the safety appliances on the elevator car were tested.

Under contract of November 27, 1906, two equalizing steel arms were installed for the cables of the elevator car. These arms are intended to equalize as far as possible the unequal expansion and contraction of the cables occasioned by wear and changes in temperature.

The counterweight cables and the elevator cables were shortened from time to time as required.

The under part of the iron stairway from the 200-foot landing down to the bottom floor, and the iron gates at entrance, were painted.

In the motor room the machinery was maintained in good working order. The wooden wainscoting in the room was repaired, all defective material having been taken out and replaced with new material. All of the woodwork was painted and the roof was repaired and painted.

In the power house the engine and all piping were kept in good order. The two boilers were frequently opened up, washed out, front and back connections cleaned, tubes brushed, and scale removed. Each boiler was in use every other month. The fronts of the boilers were painted several times during the year. In the lower engine room the walls were whitewashed and the woodwork and steam pipes painted.

At the lodge house the rooms were maintained in cleanly condition, the walls and ceilings in toilet rooms whitewashed, and a new clothes locker for the watchmen made and placed in storeroom.

The following table shows the number of visitors to the top of the Monument each month during the year, both by the electric elevator and by the stairway, the total number during the year, and the aggregate number since the shaft was opened to the public, October, 1888:

Month.	Number by the electric elevator.	Number by the stairway.	Total.	Aggregate since October 9, 1888.
1906.				
July	10,096	931	11,027	2,733,112
August	14,220	1,729	15,949	2,749,061
September	11,148	1,447	12,595	2,761,656
October	10,752	1,302	12,054	2,773,710
November	8,508	1,255	9,763	2,783,473
December	7,102	1,208	8,310	2,791,783
1907.				
January	4,896	1,422	6,318	2,798,101
February	6,892	1,137	8,029	2,806,130
March	9,766	1,743	11,509	2,817,639
April	12,207	2,461	14,668	2,832,307
May	13,555	2,099	15,654	2,847,961
June	17,005	2,656	19,661	2,867,622
Total	126,147	19,390	145,537	.....

Data relative to Washington Monument.

Height above mean low water	596 feet 4¾ inches
Height above doorsill	555 feet 5⅛ inches
Side of base—outside	55 feet 1½ inches
Side of base—inside	25 feet
Depth of foundation (sand and clay)	38 feet
Foundation on a side	126 feet 6 inches
Area	16,002.25 square feet
Top side of mounment—outside	34 feet 6 inches
Top side of mounment—inside	31 feet 6 inches
Walls, thickness—base	15 feet ¼ inch
Walls, thickness—top	18 inches
Weight of capstone	3,300 pounds
Weight of the whole monument	81,120 tons
Mean pressure at base	5 tons per square foot

Pressure on foundation nowhere greater per square foot than ..... 9 tons
Near edges, less than ..... 3 tons
(Coast Survey Report, December 1, 1884.)
Taper of monument ..... ¼ inch to 1 foot
Memorial stones (beginning at 30 feet, stopping at 280 feet) 179
Steps 898
Landings 50
Windows, at top only 8
Six are 3 feet by 1 foot 4 inches.
Two are 3 feet by 2 feet.
Cost $1,300,000
Corner stone laid July 4, 1848.
Capstone set December 6, 1884.
Dedicated February 21, 1885.
Elevator, electric, time of travel ..... 5 minutes
Elevator load ..... 35 persons
Weight of car empty ..... 5,670 pounds
Weight of car loaded, 35 persons (1 person equals 150 pounds) ..... 10,920 pounds
Weight of counterweight ..... 8,040 pounds
Cables ..... 1½ inches diameter
Dynamo ..... 50 kilowatts, 250 volts
Engine, double worm.
Speed of elevator, 100 feet per minute.
Engine governor throws off current at 105 feet per minute.
Car safety stops car at 150 feet speed per minute.
Elevator tested at 6 tons.

IMPROVEMENT OF PUBLIC RESERVATIONS IN THE DISTRICT OF COLUMBIA.

The work of the Office of Public Buildings and Grounds is divided as follows:

1. Clerical department.
2. Horticultural department.
3. Engineering department.
4. Police department.
5. Executive Mansion, greenhouses, and grounds.
6. Washington Monument.
7. Departmental telegraph.

For the purposes of administration all the parks under this Office are divided into three divisions, viz:

East division: All east of North and South Capitol streets.

Northwest division: All west of North Capitol street and north of B street north.

Southwest division: All west of North and South Capitol streets and south of B street north.

The area covered by the park spaces of the District of Columbia under the charge of this Office is 472,662 acres.

There are in all 312 reservations, varying in size from 250 square feet to 82 acres. They are classified as follows:

	Number.	Acres.
Highly improved	108	361.698
Partially improved	115	23.003
Unimproved	89	87.961
Total	312	472.662

During the year six park spaces were added to the system by the transfer to the Chief of Engineers by the Commissioners of the Dis-

trict of Columbia of the following parcels of ground under authority granted by section 2, paragraph (*b*), of the act of Congress approved July 1, 1898 (volume 30 Statutes, page 570):

Number given to reservations.	Location of reservation.	Area in square feet.	Date of transfer.
309A	Sixteenth street, between Lamont and Irving streets NW	10,200.00	Sept. 27, 1906
309B	Sixteenth and Mount Pleasant streets, between Irving street and Columbia road NW	4,020.00	Nov. 6, 1906
57D	Florida avenue and Twenty-second street, between Q and R streets NW	2,101.00	Nov. 16, 1906
305A	Columbia road, Nineteenth street, and Kalorama road NW	4,005.00	Nov. 22, 1906
313	"Loomis Park," between Bryant, Lawrence, and Adams streets, and Nineteenth place NE	102,963.84	Dec. 17, 1906
314	Center parking on Pierce street, between Jackson and Washington streets, Anacostia, D. C	10,354.73	June 20, 1907

The following described grounds were transferred by the Chief of Engineers to the Commissioners of the District of Columbia under the operations of section 4 of the law quoted:

October 27, 1906: Reservation 180, New York and New Jersey avenues, First and M streets NW. The east half (approximate) for street purposes.

December 1, 1906: Reservation 24, Pennsylvania avenue, Twenty-fifth and L streets NW. A strip of ground 2 feet wide on the L street side, for sidewalk purposes.

December 24, 1906: Garfield Park (Reservation 17). A strip of ground through the park on the line of Second street SE., for the purpose of extending that street through the park.

January 5, 1907: Garfield Park (Reservation 17). A strip on line of New Jersey avenue SE., for street purposes.

January 28, 1907: Reservation 57D, Florida avenue and Twenty-second street, between P and Q streets NW. A strip 5 feet wide on the Twenty-second street side, for sidewalk purposes.

April 2, 1907: Reservation 103, Virginia avenue and E street, between Twenty-first and Twenty-second streets NW. A strip of ground 86 feet long and 6 feet wide on the Virginia avenue side, for sidewalk purposes.

In addition to the foregoing, the Chief of Engineers, at the request of the Commissioners of the District of Columbia, temporarily relinquished to them, on October 1, 1906, jurisdiction over Reservation 200, at Maryland avenue, Seventh and C streets SW., and over the northern half of Reservation 113, at the intersection of Maryland and Virginia avenues and C street, between Seventh and Ninth streets SW., in order to facilitate the execution of the laws providing for the elimination of grade crossings in the District of Columbia.

Between July 1, 1906, and June 30, 1907, part of the $25,000 appropriated for "Improving various reservations" was devoted to improving two reservations hitherto unimproved, containing 0.326 (about one-third) of an acre. These improvements consisted in a general way of grading, soiling, seeding, making flower beds, planting trees and shrubs, and introducing water. The reservations referred to are shown on the accompanying table, which also shows those improved in the nine preceding years.

Reservations improved during the fiscal years given.

1897–98.				1898–99.				1899–1900.			
Unimproved.		Previously partially improved.		Unimproved.		Previously partially improved.		Unimproved.		Previously partially improved.	
No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.
85	0.173	29	0.329	61	0.050			19	3.020	61	0.050
207	.073	31	.338	140	.160			47	.025	154	.273
211	.105	193	.215					77	.353	163	.176
		194	.131					98	.198		
								99	.112		
								100	.141		
								102	.097		
								122	.365		
								123	.394		
								125	.414		
								126	2.102		
								134	.216		
								163	.176		
								187	.092		
								195	.288		
								206	.111		
								208	.085		
								210	.249		
								211	.105		
								212	.094		
								213	.076		
3	.351	4	1.013	2	.210			21	8.713	3	.499

1900–1901.				1901–2.				1902–3.	
Unimproved.		Previously partially improved.		Unimproved.		Previously partially improved.		Unimproved.	
No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.
78	0.108	57	0.055	73	0.014	78	0.108	155	0.004
79	.027	62	.220	81	.093			255	.015
124	.224	64	.315	82	.102			275	.002
159	.152	188	.085	112	.199				
160	.068	206	.111	138	.051				
165	.056			143	.022				
166	.072			146	.126				
190	.148			147	.087				
191	.131			148	.094				
192	.196			177	.012				
201	.507			178	.164				
209	.103			182	.108				
230	.375			183	.108				
251	.250			184	.174				
259	.124			196	.118				
260	.088			229	.224				
266	.131			276	.020				
267	.145			277	.017				
271	.015			285	.241				
277	.259								
20	3.169	5	.886	19	1.974	1	.108	3	.021

1903–4.				1904–5.				1905–6.		1906–7.	
Unimproved.		Previously partially improved.		Unimproved.		Previously partially improved.		Unimproved.		Unimproved.	
No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.	No.	Acres.
189	0.052	37A	1.657	143A	0.040	309	0.325	57C	0.226	309A	0.234
269A	.018	37B		143B	.017			126	1.994	309B	.092
		38A		177A	.040			270A	.051		
		41A		186	.166						
		41B		262	.047						
		44A		263	.040						
		65A	.193	277C	.053						
		188A	.785	300	.079						
		189A									
		277B	.020								
2	.070	10	2.655	8	.482	1	.325	3	2.271	2	.326

In addition to the foregoing, the part of Potomac Park bordering the north and west sides of the tidal reservoir, hitherto unimproved, was brought to a high state of improvement by constructing a macadam driveway from the terminus of the Seventeenth street driveway, opposite the old bathing beach, to the inlet of the Potomac River into the reservoir, grading the ground on either side of the roadway, soiling and seeding it, laying sod borders, constructing brick gutters and catch basins, cinder bridle paths and footwalks, and planting trees and shrubs, the work having been done with the special appropriation of $60,000 provided by Congress for the purpose.

Work was also commenced for constructing a macadam driveway along the river side of sections 1 and 2 of Potomac Park, and by June 30, 1907, the driveway had been completed from the inlet (where it joins the other driveway) up to the river end of the Seventeenth street sewer canal. The ground on either side of this river drive was also graded, sod borders laid, gutters and drain traps built, and cinder bridle paths and footwalks constructed. This work was done with the portion ($15,000) of the appropriation of $80,000 provided by sundry civil act of March 4, 1907, which was made immediately available.

Park curbing.—Substantial and gratifying progress has been made during the year in constructing cement copings around reservations, with corner posts of similar materials at entrances to walks. A total length of 4,069.1 feet of coping and 24 corner posts were built during the year, the work having been done under contract. The reservations thus inclosed are enumerated in the following table:

Table showing the extent of artificial stone coping constructed as borders around United States public reservations during the fiscal year ending June 30, 1907.

Reservations.	Length.	Number of corner posts.
	Feet.	
Reservation 24, Pennsylvania avenue, Twenty-fifth and L streets NW	359.0	.....
Reservation 35A, Louisiana avenue, Seventh and C streets NW	245.5	.....
Reservation 70, Massachusetts avenue, Ninth and K streets NW	242.4	2
Reservation 175, New York avenue, Ninth and K streets NW	218.2	2
Judiciary Park	3,004.0	20
Total	4,069.1	24

Park watchmen.—I especially desire to invite attention to the force of park watchmen, which force is improperly named and insufficiently paid and commanded. The designation of "watchmen" does not describe the members of this force and their duties. They are strictly policemen, with all the powers of the regular police force, and their duty is to maintain proper police control over the parks.

The force is insufficiently commanded, and it is urged that an additional sergeant and four men be added to it. The compensation of the watchmen is also not commensurate with the duties they per-

form, and it is earnestly recommended that the following schedule of pay be adopted for the force:

First sergeant in charge, per annum	$1,100
Second sergeant, per annum	1,050
Privates of class 1, per annum each	780
Privates of class 2, per annum each	900
Privates of class 3, per annum each	1,000

I am actuated in asking this increase by the fact that Congress, by act approved June 8, 1906, increased the compensation of the Metropolitan police force of this city. The act referred to increased the pay of sergeants from $1,140 to $1,250 per annum, placed the pay of privates of class 1 at $900 per annum and privates of class 2 at $1,080 per annum, and created an additional class, class 3, with compensation of $1,200 per annum. Privates of the first class consist of those who have served less than three years. Privates of the second class consist of those who have served over three years and less than five years, and privates of the third class are those who have served over five years. In preparing the foregoing new schedule for the park police I have copied the Metropolitan system, except that the rates are considerably less for the park police force.

One of the arguments used in urging an increase of pay for the Metropolitan police was the increased cost of living during the past three or four years, and that argument will apply to the park police as well as to the Metropolitan force.

While it may be held that in many cases the duties of the park police are not as onerous as those of the men doing duty on the streets and for that reason they are not entitled to the same rates of pay, yet it can not be denied that the present pay of the park force is inadequate and should be increased for the reasons stated here, and also at length in the annual reports of this office for some years past.

I consider the question of adequate compensation for this body of faithful public servants of much importance, and it is hoped that Congress will give my recommendation favorable consideration.

The designation of the members of the force should also be changed from that of "park watchman" to "park policeman." Park watchmen were, by act of Congress approved August 5, 1882 (22 Stats., p. 243), given the same powers and duties as the members of the Metropolitan police force of this city, and the designation "policeman" better describes the duties performed by them. Moreover, it conveys to the public a more convincing idea of authority.

The acts of Congress providing for park watchmen have designated the parks in which each shall perform duty. It is considered that it would be an improvement were the necessary watchmen provided, without assigning them to particular parks. Under such an arrangement the members of the force could be assigned from time to time by the officer in charge to the parks where their services might be most needed.

It is also recommended that the appropriation for contingent expenses be increased by $300, to provide for the purchase and repair of bicycles for the use of those members of the force who are mounted. At present 15 of the men have bicycles which were pur-

chased from time to time by this Office with funds provided for the care of the public grounds. In the larger parks and in sections where a watchman has many smaller reservations, scattered over a considerable area, to look after in addition to the particular park to which he is assigned, the efficiency of the men is doubled by the use of a bicycle. It is recommended that the appropriation mentioned be increased for the purchase and repair of wheels in order that the general appropriation referred to may be relieved of that burden. There should also be funds provided for the purchase and repair of revolvers for the members of the force, as is done in the case of the Metropolitan police. At present the members of the park police have to pay for their revolvers from their personal funds. The Government provides them with batons and hat badges and breast badges, and revolvers should be provided in the same way.

There is a great necessity for another sergeant. During the past year the one sergeant allowed has, with few exceptions, inspected each day watchman daily during the year, has looked after outlying reservations not provided with watchmen, visiting them from three to six times per week, has inspected the night watchmen three times weekly, has been present in command of the watchmen at band concerts now given four times per week during the summer in the parks. He has also reported at this office each morning (except Sunday) to make reports and receive instructions, and has been present at the police court many times to watch cases taken there by the privates of the park force. These duties are greater than one man should be required to perform, and there should be a second sergeant to relieve and assist him. The discipline of the force could also be better maintained were there two sergeants, for there could then be a sergeant on duty continuously with the privates.

It is also recommended that necessary legislation be adopted providing that all fines and forfeitures of collateral from cases brought before the police court by United States park police shall be held and reserved for the benefit of the United States park police under rules similar to those now in force for the Metropolitan police of the city.

The table on the following page shows that in the parks for which watchmen are provided there were 286 arrests made during the year, and that the fines imposed and collateral forfeited in those cases amounted to $1,598; that in addition to the arrests made 2,548 drunken people and 886 persons of objectionable character were ejected from the parks.

	1906.						1907.						Total.
	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	
Nature of offense.													
Disorderly	23	16	22	6	1	6	.....	.....	4	13	16	18	125
Drunkenness	6	3	5	2	4	7	5	1	2	4	4	2	45
Trespassing	7	.....	2	1	.....	.....	3	2	1	2	3	.....	21
Vagrancy	3	1	4	2	2	.....	.....	2	2	2	4	1	23
Indecent exposure	6	1	1	3	2	1	1	.....	2	3	2	3	25
Violating park regulations	1	2	2	4	.....	.....	.....	.....	.....	1	1	.....	11
Fast driving of horses	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Fast driving of automobiles	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Assault	.....	.....	.....	1	.....	.....	.....	.....	1	1	1	2	6
Robberies	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	2
Violating hack regulations	.....	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8
Cruelty to animals	.....	.....	.....	1	1	.....	.....	.....	.....	1	.....	2	5
Throwing missiles	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Violating police regulations	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Affrays	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Escaping prisoners	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	2
Indecent assault	.....	.....	1	.....	1	1	.....	.....	.....	.....	.....	.....	3
Larceny	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	2
Insane	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Total number of arrests	47	33	40	21	12	15	9	5	14	31	31	28	286
Drunkards ejected	286	298	306	213	220	125	125	46	169	164	315	281	2,548
Objectionable characters ejected	98	112	85	68	69	38	41	8	64	83	112	108	886
Disposition of cases.													
Fined	13	8	11	4	1	1	1	1	3	7	5	14	69
Forfeited collateral	13	16	9	9	5	5	2	3	5	15	12	4	98
Personal bonds taken	2	2	.....	1	.....	.....	.....	.....	.....	.....	1	2	8
Sent to workhouse	8	1	15	3		2	1		3	4	7	6	50
Drunkards released	6	3	5	2	4	7	5	1	2	4	4	2	45
Cases nolle prossed	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Dismissed	.....	2	.....	.....	.....	.....	.....	.....	1	.....	2	.....	5
Sent to reform school	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Turned over to childrens' guardians	3	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	4
Insane	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	2
Sent to grand jury	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2
Turned over to parents for correction	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Sent to penitentiary	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2
Total cases disposed of	47	33	40	21	12	15	9	5	14	31	31	28	286
Record of fines.													
Total amount of fines	$75	$48	$128	$25	$5	$5	$2	$40	$40	$61	$24	$80	$533
Total amount of collateral forfeited	187	125	105	77	120	25	10	46	45	190	110	25	1,065
Total fines and collateral forfeited	262	173	233	102	125	30	12	86	85	251	134	105	1,598
Total accidents	.....	3	3	1	1	.....	.....	.....	1	.....	.....	.....	9
Sick and injured sent home or to hospital	.....	6	2	.....	1	.....	.....	1	1	1	1	.....	13
Attempted suicide	.....	1	1	.....	.....	.....	.....	.....	1	.....	.....	1	4

CHILDREN'S PLAYGROUNDS.

Special attention was invited to this subject in my annual report for 1904, page 3922, Report of the Chief of Engineers for 1904, and the recommendations therein made are repeated, namely: That an appropriation of $3,000 be made for establishing, maintaining, and caring for children's playgrounds on public reservations in Washington. It is also recommended that authority be given to this office to erect or permit the necessary structures thereon. During the past three years the public playgrounds committee have desired to place,

at their own expense, temporary wooden structures for shelter and the use of children in their games on some of the reservations that have been set aside as playgrounds. They could not, however, be permitted to do this, as the act approved August 30, 1890, volume 26, Statutes, page 396, prohibits the erection of temporary structures of any kind upon any reservation except when authorized by special act of Congress.

MAINTENANCE OF IMPROVED PARKS.

The usual work required for maintaining the improved parks and park spaces in good condition was extended during the year. This work consisted of mowing and raking lawns, edging their borders, sodding or seeding bare places on them, planting and caring for flower beds, pruning trees and shrubs, trimming hedges and removing dead trees, cleaning gutters and draintraps, and sweeping paved roads and walks. In the autumn of 1906 some of the flower beds were planted with pansy plants and some with flowering bulbs for early spring bloom. In these plantings 10,000 pansies and 31,000 bulbs were used. In the spring of 1907 the beds and vases were planted with 970,219 bedding and tropical plants for summer decoration. These beds were protected in most cases by hooped irons placed around them.

The special efforts made by this Office during the fiscal years 1904, 1905, and 1906 to remove the blemishes caused by bare places on the lawns and worn borders by resodding have been continued, and during the year ending June 30, 1907, 12,792 square yards of sod were used in sodding those places, vastly improving the appearance of the parks and park places thus treated.

In addition to the foregoing the following special work was accomplished:

NORTHWEST DIVISION.

DuPont Circle.—Twelve partly decayed trees were taken out in order to give more light for the growth of small shrubs and grass which had been too heavily shaded. All bare places on lawns were sodded. The interior of the lodge house was painted, and the glass in the windows refrosted. Repairs were made to the asphalt footwalks, the area resurfaced amounting to 825 square yards.

Franklin Park.—The basin of the fountain, its supply pipe and that of the drinking fountain were repaired, and two small cement basins were built for holding water for the squirrels. The gravel walks were given a coating of screened gravel, 134 cubic yards of that material having been used for the purpose. Portions of the brick gutters that were out of line were reset, 72 feet of 8-inch terra-cotta drain pipe were laid to drain walks and parking, and new iron grating frames were placed on the brick drain traps on sides of walks. An enameled iron wash basin was erected in the lodge house, and supply and waste pipes run for same. Repairs were made to the asphalt walks, and an area of 760 square yards resurfaced, bare places on lawns were loosened up and resodded, 520 square yards of sod having been used. The interior of the lodge house was painted and glass in the windows refrosted. A new brick foundation was built under the drinking fountain.

Farragut Park.—Worn places in the asphalt walks were repaired, the area resurfaced, amounting to 135 square yards.

Iowa Circle.—The lawns were top dressed with bone meal in March.

Judiciary Park.—The approaches and walks around the Pension Office building were extensively repaired. The old asphalt pavements at the east and south parts of the building were taken up and 1,233 square yards of new asphalt pavement, 9 inches thick in all, laid in place thereof. Some rearrangement of drains was done preparatory to laying of the new pavement and six new brick draintraps constructed, and 248 feet of terra-cotta drainpipe and 18 feet of cast-iron drainpipe laid. The old asphalt foot walks at the north, northeast, and northwest sides of the building were taken up and replaced with new cement walks 5 inches in thickness. The area of new cement walk constructed was 1,746 square yards, and 64 linear feet of cement steps were constructed at the street end of the walk leading out from the northwest corner of the building, being rendered necessary on account of the steep grade of the ground there. The granite steps on the east and west sides of the north entrance were reset to conform to the grade at that point. Two small spaces formerly paved with asphalt and not repaved with cement, one at the west side of south door and the other at northwest corner, were filled with soil and seeded, and a sod border laid around them, and 93 square yards of old asphalt pavement were removed from two strips of walk at the east and west ends of the building and replaced with gravel. The gravel borders of the new cement walks were regulated. A new cement coping 3,004 feet in length, with 20 corner posts at the park entrances, was constructed around the borders of the park with the exception of a short distance on the Fifth street side, which can not be constructed until the old brick pavement there is replaced with a cement sidewalk by the District government. The ground back of the new coping was raised, graded, and sodded. The ground on the Fourth street side, between G an E streets, required a fill of about 8 inches, while that on the Fifth street side from E to F streets had to be raised 18 inches, and this required the park surface to be graded for a considerable distance back from the coping. A border of sod 4 feet wide was laid around all of the trees in this newly graded ground, and the erea not sodded will be sown with grass seed when in proper condition. At the entrance to the park at Fifth and G streets 287 linear feet of brick gutter, 21 inches wide, were taken up, the ground raised to the grade of the new cement walk there, and the ground along the edges of the gutters was regraded and sodded. On the Fourth street side of the park at F and G street entrances, sod was lifted from low places on the lawns, the ground regraded, the sod relaid and borders edged.

Some wooden post and iron wire fencing were put up on east side to prevent trespassing and portions of the old fencing repaired. Gravel roads and walks were repaired, about 510 cubic yards of the material having been used. Two of the old iron posts in the iron pipe fence at the south front of the Pension Office building used for hitching horses were removed and replaced with better posts, and 61 feet of the old iron pipe were taken out and replaced with galvanized-iron pipe. This fence was painted. The roof of the lodge house was repaired and repairs made to closets and plumbing therein. A large

sugar maple tree, damaged by a wind storm, was taken down and removed, and two dead shrubs and one small dead tree taken out. A few limbs were broken by a windstorm on May 27, but not much damage done. Two brick draintraps to catch the water from walks were built; 117 square yards of sod were laid on the lawn surface at south door of Pension Office building. Portions of the lawn surfaces were fertilized with manure and portions with bone meal; 24 iron posts and 75 feet of pipe-rail fence, placed in the park to prevent trespassing, were painted. The water service was extended to the south side of the court-house building, 116½ feet of 2-inch, and 344½ feet of 1¼-inch galvanized-iron water pipe having been laid, and four hose valves placed thereon for the purpose. Repairs were made to the old asphalt walks, 35 square yards having been resurfaced.

Lafayette Park.—Repairs were made to the woodwork of the lodge house and the new work was painted. Eighteen feet of terra-cotta drainpipe were laid to drain one of the walks. Sixteen cubic yards of screened gravel were used in repairing washouts in the walks. Some slight damage was done to the trees by a windstorm on May 27. Repairs were made to the asphalt walks, the area resurfaced, amounting to 10 square yards.

McPherson Square.—Repairs were made to the asphalt walks, the area resurfaced, amounting to 35 square yards. Bare places in the lawns were loosened and sodded, 400 square yards of sod having been used for the purpose. New supply pipes were placed in the drinking fountains, and two small cement basins were built for holding water for the squirrels.

Mount Vernon Park.—A sod border varying in width from 1 to 3 feet was laid around the park and bare places around the trees and on the lawns were loosened and sodded, 750 square yards of sod having been used. New wooden stakes were set in the wire fence around the park at the corners, and the fence was repaired.

The President's Park (White Lot).—Repairs were made to the gravel roads and walks, 335 cubic yards of unscreened gravel and 105 cubic yards of screened gravel having been used for the purpose. That portion of the main gravel roadway around the ellipse which is on the east side of the park was surfaced with crushed trap rock, a length of roadway of 950 feet by its full width of 45 feet having been thus covered. A strip 60 feet by 17 feet, where the road branches into E street, a strip 45 feet by 22 feet where it branches into a walk, and an angle containing 193 square feet, were also surfaced with the material, making a total of 4,994 square yards of surface thus covered. Limestone dust was spread as a binder between the layer of 1¼-inch trap rock which was placed on the gravel roadway and the trap rock screenings which formed the top course. The material used in this work was 1,012$\frac{1}{10}$ tons of trap rock and 96½ tons of limestone. Some wire fencing to prevent trespassing was erected and old fencing repaired. Bare ground was loosened up and sodded, 153 square yards of sod having been used for the purpose. Four of the old wooden bridges over gutters on line of bridle path were replaced with new bridges. A cement walk was laid around the borders of the great ellipse in this park. This walk is about 3,000 feet long and 6 feet wide, and has lead walks leading in from the main driveway at various points and about opposite the walks leading into the park from the

surrounding streets. Dressed flagstones were placed across the gutters at the entrances to the leads. The total area of this cement walk, including the leads, was 2,139 square yards. Before the contractor commenced excavating for the walk, laborers employed by this Office cut and lifted the sod from the inner line of the proposed walk out to the gutter. As the laying of the walk progressed this strip of ground (16 feet wide) was dug up and graded anew, a border of sod 2 feet wide laid along either edge, and a sod border 3 feet wide laid around each of the large American elm trees standing around the edge of the ellipse in the center of the border. Portions of the lawn surface along the inner edge of the walk were too high in some places and in others too low. At these places the sod was lifted, the ground regraded to the level of the walk, and the sod relaid. The newly graded ground not sodded was seeded and rolled. A brick draintrap was constructed and 25 feet of 4-inch cast-iron drainpipe laid to drain one of the walks in the south side of the park. An opening for a window was cut in the north wall of the lodge house at Fifteenth and B streets and a sash inserted, glazed, and painted. Ninety-two trees in the grounds on the east and south sides of the park in the locations where the plantings were overcrowded were grubbed out and removed. The holes left were filled with clay, soil spread, and seed sown. Other portions of the lawns were loosened, grass seed sown, and the parking along B street was graded and seeded. Bone meal was sown over the lawns. Seventy-one feet of terra-cotta pipe were laid, and one new cement catch-basin built to carry off surface water. One medium sized tree was blown down by a windstorm on May 27.

On Easter Monday afternoon, April 1, a concert was given by the Marine Band for the pleasure of the children in accordance with usual custom. The platform, chairs, and music racks for the band men were placed on the north side of the ellipse. These preparations for the concert and the cost of the labor employed in cleaning up the grounds thereafter amounted to about $17.

Rawlins Park.—A section of the water main was cut out, a new fish trap set in, and a cement manhole built over it. Repairs were made to the basins of the two small fountains.

Thomas Circle.—Bone meal was sown over the lawns.

Truxtun Circle.—The large iron fountain was scraped, cleaned, and painted, and its basin was repaired.

Washington Circle.—The interior of the lodge house was painted and the glass in windows refrosted.

Reservation 22, Pennsylvania avenue, Twenty-eighth and M streets NW.—A new 2-inch galvanized-iron pipe was run into the reservation to supply the fountain basin with water.

Reservation 24, Pennsylvania avenue, Twenty-fifth and L streets NW.—The Commissioners of the District of Columbia laid a new cement sidewalk on the Pennsylvania avenue side and the L street side of this reservation, and in order to widen the walk on the L street side from 10 to 12 feet they requested the Chief of Engineers to transfer to their jurisdiction a strip of ground on that side 2 feet wide. This was done by the Chief of Engineers by letter dated December 21, 1906, under authority granted by the act of Congress approved July 1, 1898. As the post and chain fence on the Pennsylvania avenue side was also in the way of the new sidewalk, the entire fence was taken down by the contractors and hauled to the storage

grounds by this Office. In April a cement coping 359 feet in length was constructed around the border of the reservation in place of the fence, the sod was removed from the greater portion of the surface, clay used to bring the ground to the grade of the new coping, the soil respread, and the sod relaid.

Reservation 34, Pennsylvania avenue and C street, between Ninth and Tenth NW.—The large iron fountain and the iron post and bar fence were painted.

Reservation 35, Pennsylvania and Louisiana avenues, between Eighth and Ninth streets NW.—The post and bar fence was painted. The 2-inch cast-iron main supplying the reservation was broken by workmen raising the car tracks. It was replaced under the tracks with 32 feet of 1-inch lead pipe.

Reservation 36A, Louisiana avenue, Seventh and C streets NW.—The stake and wire fence inclosing this circle was taken down and replaced by a cement coping 245 feet 5 inches in length. This necessitated regrading the surface and the soil was removed and piled, 120 cubic yards of clay used in bringing up the grade, the soil spread and the ground sodded.

Reservation 57C, Twenty-second street, between Decatur and S streets NW.—A cement walk was constructed at the top and bottom of the stone terrace in the center of this space and the curb in front of that at the top was trimmed down. The area of the new walk was 40 square yards.

Reservation 57D, Florida avenue and Twenty-second street, between P and Q streets NW.—This triangular space, which contains approximately 2,101 square feet, was transferred to the Chief of Engineers by the Commissioners of the District of Columbia on November 16, 1906, under the authority granted in section 4 of the act of Congress approved July 1, 1898. During the month of December water was introduced into the reservation by this Office, 45 feet of 1-inch lead pipe and 6 feet of 1¼-inch galvanized-iron pipe having been laid for the purpose. On January 8 the Commissioners requested that a strip of ground 5 feet wide on the east (Twenty-second street) side of the reservation be returned to them for sidewalk purposes, and this was done by the Chief of Engineers on January 28. The strip returned to the Commissioners contains 420 square feet.

Reservation 68, Massachusetts avenue and L street, between Eleventh and Twelfth streets NW.—The fountain and one plant vase were painted.

Reservation 69, Massachusetts avenue and L street, between Tenth and Eleventh streets NW.—One plant vase was painted.

Reservation 70, Massachusetts avenue, Ninth and K streets NW.—The iron post and chain fence was removed, a cement coping 242 feet 4 inches long, with two cement corner posts constructed in its place, the sod and soil removed and piled, 295 cubic yards of clay used to raise the ground to the grade of the new coping, the soil spread, sod laid around the borders and the remainder of the ground seeded.

Reservation 77, New Jersey avenue, First and G streets NW.—The large iron fountain and the post and chain fence inclosing the reservation were painted.

Reservation 103, Virginia avenue and E street between Twenty-first and Twenty-second street NW.—On April 2, 1907, the Chief of Engineers, at the request of the Commissioners of the District of

Columbia, transferred to them, for sidewalk purposes, a strip of ground 6 feet wide and 86 feet long on the south (Virginia avenue) side of the reservation. This transfer was made under the authority granted by section 4 of the act of Congress approved July 1, 1898 (vol. 30, Stat. L., p. 570). The area transferred covers 516 square feet and will reduce the area of the reservation from 1,342 square feet to 826 square feet.

Reservation 143, New Hampshire avenue, Eighteenth and Q streets NW.—The flower bed in this reservation was planted with evergreen shrubs in October.

Reservation 150A, Connecticut avenue, Eighteenth and N streets NW.—The surface of this triangle was resodded, 105 square yards of sod having been used for the purpose.

Reservation 156, Rhode Island avenue and Q street east of Tenth street NW.—The iron post-and-chain fence around this small reservation was taken down and hauled to the storage grounds. The District government lowered the street curb around the reservation, and the surface of the ground was regraded and resodded by this Office.

Reservation 158, Rhode Island avenue, Seventh and R streets NW.—A new cement sidewalk was laid by the District government on the Seventh street side of the reservation, which walk was made 3 feet narrower than the old one. The ground left bare was brought into the reservation by moving out the post-and-chain fence 3 feet on the Seventh street side.

Reservation 175, New York avenue, Ninth and K streets NW.—The post-and-chain fence was taken down, a cement coping 218 feet 2 inches long and two corner posts constructed, the sod and soil taken up and piled, 250 cubic yards of clay used to bring the ground to the grade of the new coping, the soil respread, a border of sod 2 feet wide laid around the ground just within the coping, and the remainder of the ground seeded and rolled.

Reservation 179, New York avenue, Third and M streets NW.—The post-and-chain fence was repaired.

Reservation 180, New York avenue, Third and M streets NW.—On October 27, 1906, the Chief of Engineers transferred to the Commissioners of the District of Columbia, at their request, for street purposes, the east half of this reservation, under authority conferred by the act approved July 1, 1898.

Reservation 189B, center parking on C street between First street and New Jersey avenue.—A street washer was removed and replaced by a hose valve with connecting pipe to water main.

Reservation 273, Vermont avenue and Ninth street between V and W streets NW.—Water was introduced into this reservation by laying 20 feet of 1-inch lead pipe and 6 feet of 1¼-inch galvanized-iron pipe.

Reservation 305A, Columbia road, Nineteenth street, and Kalorama road.—On November 22, 1906, the Commissioners of the District of Columbia, under authority granted by the act approved July 1, 1898, transferred this piece of ground to the Chief of Engineers for park purposes.

Reservation 309A, Sixteenth street extended between Lamont and Irving streets NW.—This piece of ground was transferred to the Chief of Engineers by the Commissioners of the District of Columbia on September 27, 1906. It is triangular in shape and contains about 10,200 square feet. It was improved during the autumn of 1906 by

this Office. The ground was graded, water introduced by laying 33 feet of 1-inch lead pipe and 65 feet of 1¼-inch galvanized-iron pipe, a flower bed 20 feet in diameter laid out, a border of sod 2 feet wide laid around the reservation, the remainder of the ground seeded, and 5 deciduous trees and 78 flowering shrubs planted.

Reservation 309B, Sixteenth street extended and Mount Pleasant street NW. between Irving street and Columbia road.—This reservation was transferred by the Commissioners of the District of Columbia on November 6, 1906. It is a triangle and contains about 4,020 square feet. It was improved by this Office in November and December, 1906. The ground was graded, covered with soil, a border of sod laid, grass seed sown, 33 feet of 1-inch lead pipe and 41 feet of 1¼-inch galvanized-iron pipe laid for introducing water, and 7 deciduous trees and 48 flowering shrubs planted.

Reservation 313 (Loomis Park) between Bryant, Lawrence, and Adams streets and Nineteenth place.—On December 17, 1906, the Commissioners of the District of Columbia transferred this piece of ground, known as "Loomis Park," to the Chief of Engineers. It contains about 2⅓ acres (102,963.84 square feet). It is unimproved, is in grass, and covered with a small native growth of trees and inclosed with an iron post-and-chain fence.

SOUTHWEST DIVISION.

Henry Park.—The ground refilled over the trench of the large trunk sewer constructed through these grounds was restored during November and December. The lawn surface was graded, soiled, and seeded, trees and shrubs planted, gravel roads and walks reconstructed, and 86½ square yards of asphalt footwalk relaid. In the other portions of the park 20 cubic yards of gravel were used in repairing gravel roads, bare places on lawns were reseeded, bone meal was sown over portions of them, 37 park settees were painted, and 8 dead trees were taken out and removed. Some damage was done to the trees by a heavy windstorm on May 27. Forty-seven square yards of sod were laid on bare places on lawns.

Monument grounds.—Eleven hundred and five cubic yards of gravel were used in repairing gravel roads, and 244 linear feet of cobblestone gutter, 30 inches wide, were laid along the margins of the road east of the fish ponds. Worn places in the sand bridle paths were repaired, the brush horse jump on the path was replaced with new brush, and two wooden bridges were built over gutters on the line of those paths. Six thousand five hundred and fifty-seven cubic yards of clay were received without expense to the United States and used in filling up the south end of the south fish pond. Trenches were opened and 85 feet of 2-inch galvanized-iron water pipe and 20½ feet of 1¼-inch galvanized-iron water pipe were laid. Bone meal was sown over portions of the lawns and grass seed sown on bare places. Twenty-one feet of 6-inch cast-iron drainpipe were laid to drain one of the roadways. Sixty-seven park settees were painted. Bare places on the lawns were sodded, 180 square yards of sod having been used in the work. The windstorm of May 27 did some damage to the trees in this park.

The Department of Commerce and Labor having abandoned the two fish ponds in these grounds, this Office on June 7, 1907, assumed

control of them under the authority contained in general deficiency act approved June 30, 1906. The south fish pond and the southeast corner of the north fish pond were subsequently, on June 26, 1907, transferred by the Secretary of War to the Commissioners of the District of Columbia for use as a bathing pool, in consideration of their having abandoned the inner reservoir in Potomac Park hitherto used by them for that purpose.

Monument grounds annex.—Work was continued filling the low ground south of B street north and between Eighteenth and Nineteenth streets extending to the sewer canal. During the year 6,607 cubic yards of brickbats, old mortar, and clay were hauled in and used to fill up low portions of the ground, and 7,887 cubic yards of good clay were received and used in the top grading. All of this material was brought in without expense to the United States.

Worn places in the cinder walks were repaired. Trenches were opened in the lawn surface on the west side of the Seventeenth street driveway, and 737 feet of 2-inch and 700 feet of 1¼-inch galvanized-iron water pipe laid, and nine hose valves placed for irrigating purposes. The sea wall at the foot of Seventeenth street was connected with the east wall of the new landing basin there, 9 cubic yards of concrete wall being constructed and 328 feet of two-rail pipe fencing placed in position; 90 square yards of sod were laid at the entrance to the road in West Potomac Park.

Work was commenced on June 10 for changing about 800 linear feet of the river drive from its intersection with the Fifteenth street roadway out to Fourteenth street, due to the change of grade on the latter street, now being lowered by the District government, and the opening up of Water street at that point. The roadway commencing at the Fifteenth street roadway is to be deflected to the east so as to come out at Fourteenth street opposite Water street. During June 1,388 square yards of the new roadbed was excavated, the Telford base stone removed from the old road laid upon it, 1,335 square yards of bridle path made, and 200 square yards and 50 linear feet of brick gutter constructed. Seven hundred and ninety-five cubic yards of earth were handled in doing this work.

Potomac Park east.—This part of the park is situated between the embankment of the Pennsylvania Railroad bridge, the Potomac River, and the tidal reservoir. Its improvement was practically completed, with the exception of some minor work, during the preceding year. During the present year 4,821 cubic yards of clay were hauled in without expense to the United States and used in grading the south end of the sunken field, and 218 cubic yards of soil were used in surface grading. The stock of trees and shrubs in the new nursery was worked and cared for. The sea wall near the inlet from the river to the tidal reservoir was leveled up. The trees on roadways were staked and wired. Bone meal was sown over the lawns. Six wooden bridges were built across gutters at entrances to bridle paths, 45 square yards of additional cinder walk constructed, 244 square yards of sod laid, and fifty evergreens planted in the nursery. Some damage was done to the trees during a heavy wind storm on May 27. Six trees were planted on driveway. Work was commenced in June, 1907, for constructing the roadway to be placed along the foot of the embankment of the railroad bridge, to extend

from the south end of the river road to the approach to the roadway on the embankment of the highway bridge, and the following work accomplished: One thousand six hundred and eighty square yards of roadbed were graded, base stone spread over an area of 890 square yards, 1,295 linear feet of brick gutter laid, six catch basins built, 55 square yards of sod laid, and 200 feet of 10-inch terra cotta sewer pipe laid.

Seaton Park.—A section of the 4-inch water main was cut out and a new 4-inch gate valve put in to control the service. Four cement basins were placed to hold water for the birds and squirrels. The roof of the park lodge was repaired. Work was completed for restoring the ground filled in over the large public sewer constructed through these grounds. Worn places on gravel road were repaired, 45 cubic yards of that material having been used; 301 square yards of sod were laid on bare places on lawns. Some damage was done to the trees by a wind storm on May 27.

Smithsonian grounds.—Five cement basins were built for holding water for birds and squirrels, and six wooden boxes were made for squirrel houses to replace old ones. Worn places in gravel roads were repaired, 102 cubic yards of gravel having been used for the purpose. The ground filled in over the large public sewer constructed through these grounds was restored by grading, soiling, and seeding lawn surfaces, reconstructing gravel roads, and relaying 15 square yards of asphalt footwalks. About three-quarters of the main asphalt roadway from Seventh to Twelfth streets, passing in front of the National Museum and Smithsonian Institution buildings, and the entire surface of the branch road between those buildings, were repaired, the area resurfaced, amounting to 5,615 square yards. Eighty-five square yards of board walk were constructed. Portions of the lawns were sown with bone meal, and grass seed was sown over bare places. One hundred and twenty park settees in the grounds were repaired, refastened to the ground, and painted. Some of the borders were sodded, and 47 iron posts, 170 feet of iron chain, 191 park settees, and the interior of the watchman's lodge were painted. One large maple tree was uprooted by the wind storm on May 27 and branches broken from other trees of same variety; five large trees were broken off near the ground and had to be taken out. The roof of the park lodge was repaired and the chimney taken down.

Reservation 202 (Garfield Circle), Maryland avenue and First street SW.—The entire surface of this circle was resodded, as the old grassed surface was in very bad condition.

Circle at Pennsylvania avenue and First street NW. (Peace Monument).—As the surface of the ground had become very bare of grass it was loosened up and entirely resodded.

Reservation 285, Canal, First, and D streets SW.—The lawn surface was sown with grass seed.

MACADAM ROADWAY ALONG THE NORTH AND WEST SIDES OF TIDAL RESERVOIR IN POTOMAC PARK.

This roadway was constructed and the ground on either side thereof was improved with the $60,000 appropriated by Congress for the purpose in sundry civil act for the fiscal year ending June 30,

1907, approved June 30, 1906. The roadway is 44 feet wide and 4,650 feet long, and extends from the terminus of the Seventeenth street roadway east of the old bathing beach around to the inlet from the Potomac River into the tidal reservoir. The lawn surfaces on either side of the roadway were graded and seeded, sod borders laid, cinder walks, bridle paths, gutters, and catch-basins constructed, water pipe and drainpipe laid, and trees and shrubs planted. The following table shows the work done in making the foregoing improvements:

Area of main driveway built	square yards	22,570
Area of cinder walks constructed	do	9,040
Area of cinder bridle paths constructed	do	5,990
Area of brick gutters, 2 inches wide, laid	do	2,020
Area sodded	do	5,000
Area graded	do	127,740
Brick catch basins built		36
Quantity of clay handled	cubic yards	15,760
Quantity of soil handled	do	14,030
Quantity of cinders handled	do	1,200
Sea wall built at inlet (492 cubic yards stone)	linear feet	500
Six-inch cast-iron water pipe laid	do	4,974
Four-inch cast-iron water pipe laid	do	100
Three-inch cast-iron water pipe laid	do	2,343
Two-inch galvanized-iron water pipe laid	do	3,295
One and one-quarter inch galvanized-iron water pipe laid	do	6,085
Ten-inch terra-cotta drainpipe laid	do	214
Eight-inch terra-cotta drainpipe laid	do	550
Six-inch terra-cotta drainpipe laid	do	2,091

Three hundred and thirteen trees were planted along the borders of the roadway, and 217 trees and 1,200 shrubs planted over the lawn surfaces.

A boat-landing basin, consisting of two concrete inclosing walls built on piles, was constructed in the northeast corner of the tidal reservoir, near the old bathing beach. Both walls are finished on top with a concrete foot walk 6 feet wide, with a 6 by 10 inch coping on either side and with an iron-pipe hand railing along the edge of the two arms of the walls.

Reproductions of two photographic views of the foregoing improvements in Potomac Park accompany this report.

MACADAM ROADWAY ALONG THE RIVER SIDE OF SECTIONS 1 AND 2 OF POTOMAC PARK.

In sundry civil act for the fiscal year ending June 30, 1908, the sum of $80,000 was appropriated for constructing a macadam roadway along the west side of sections 1 and 2 of Potomac Park to extend from the inlet of the tidal reservoir to the foot of Twenty-sixth street NW., and for improving the grounds on either side of same. Of the amount appropriated, $15,000 was made immediately available. Work was immediately commenced in March, and by the end of June the roadway was practically completed from the inlet up to the sewer canal, which separates section 1 of the park from section 2, a length of 2,550 feet by 44 feet in width. The ground on either side of this roadway was graded, borders sodded, brick gutters laid, and catch basins built, cinder foot walks and bridle paths constructed, and water pipe and drainpipe laid. The following table shows the work done

VIEW OF POTOMAC PARK BASIN DRIVE.

From the Inlet, looking northeast toward the city.

in making these improvements, which will be continued on the north side of the sewer canal after July 1:

Area of driveway built	square yards	12,222
Area of cinder walk constructed	do	3,000
Area of bridle path constructed	do	1,680
Area of brick gutters, 2 inches wide, laid	do	1,111
Area sodded	do	750
Area graded	do	20,000
Brick catch basins built		20
Quantity of clay handled	cubic yards	9,000
Quantity of soil handled	do	3,000
Quantity of cinders handled	do	900
Two-inch galvanized-iron water pipe laid	feet	1,712
One and one-quarter inch galvanized-iron pipe laid	do	14
Six-inch terra-cotta drainpipe laid	do	1,192

EAST DIVISION.

Center parking on Pennsylvania avenue between Second and Sixteenth streets SE.—The flagstone walks or pavements at the intersections of the cross streets used by passengers in entering or leaving the street cars, were taken up and replaced with cement walks. Eight cross walks were laid and three waiting platforms constructed, one at Eighth street and two at Fifth street, on either side of the tracks. The total area of cement pavement laid was 230 square yards. Places left bare by the removal of the flagging were filled with soil and sodded, and all the bare places along the parking were seeded or sodded; 1,091 square yards of sod were used on the parking. Gravel walks were constructed at six of the crossings between Second and Fourteenth streets. The Capital Traction Company excavated along the center of the parking between their car tracks to lay conduit for their feeder cables.

Folger Park.—Bare places on the lawns were loosened up and seeded, and worn borders were resodded, 132 square yards of sod having been used for the purpose. Two dead trees were removed, worn places around the trees on the sidewalks were resodded, and 24 park settees were painted.

Garfield Park.—On December 24, 1906, the Chief of Engineers transferred to the Commissioners of the District of Columbia for street purposes, a strip of ground 46 feet wide through the park on the line of Second street, and during the spring of 1907 the Commissioners opened the street, paved the roadway, and laid curbing and sidewalks. On January 5, 1907, a strip 70 feet wide on the line of New Jersey avenue was transferred to the Commissioners, and they have graded this up from E street to meet the bridge for the overgrade crossing over Virginia avenue and the tracks of the Pennsylvania Railroad. In cutting through Second street the materials were stored for use by this Office when the park surfaces are rearranged. The opening of this street through the park divides it into two sections and renders the gravel roadways therein no longer necessary. They will be replaced by walks and lawn surface. Some preliminary work to this end was done in April, May, and June by plowing up the gravel roadways and hauling the material to other parks for repairing roads and walks. The District government closed the entrances to the old park roads at the northeast and southeast corners of the park at Third street by curbing, and extended the paved side-

walks around those points. They also narrowed the brick sidewalk on the north side of the park to 6 feet. This left a depression in the parking, which was filled in by this Office with 43 loads of clay.

Lincoln Park.—Low places on the lawns were raised with soil and seeded, bare places on them also seeded, and borders resodded, 384 square yards of sod having been used for the purpose. The flooring in the park lodge was repaired, a locker built, and new spouting put up. The two large fountains, the two drinking fountains, and 84 park settees were painted. Repairs were made to asphalt walks, the area resurfaced, amounting to 150 square yards. Worn places around the trees on the sidewalks were resodded. The windstorm on May 27 did considerable damage to 26 trees in this park. One tree was entirely uprooted and had to be removed.

Marion Park.—Bare places on lawns were loosened and grass seed sown and worn borders were resodded, 125 square yards of sod having been used for the purpose. Holes in the driveway were regraveled.

Stanton Park.—The lawn surfaces were given a coating of bone meal, bare places were loosened and sown with grass seed, and worn borders were resodded, 272 square yards of sod having been used for the purpose. The iron post and chain fence, consisting of 193 posts and 1,540 feet of chain, 63 park settees, and the exterior of the watchman's lodge were painted, and some painting was done in the interior of the lodge. The asphalt walks around the mound at the base of the statue of General Greene and around the two fountains were extended over bare places so as to complete the walks around those places. The area covered amounted to 88.7 square yards. Some damage was done to trees in this park by the storm of May 27.

Various reservations.—Bone meal was spread over the lawns of 26 of the small reservations and the worn borders of 33 of them were resodded, 391 square yards of sod having been used for the purpose, Some damage was done to the trees in 9 of these reservations by the wind storm of May 27.

Reservation 122, Virginia avenue, Fourth and I streets SE.—Work was commenced in May for restoring this reservation, which was rendered necessary by the raising of Virginia avenue in connection with the elimination of grade crossings. The ground was plowed and brought to the new grade of the avenue, soil spread, and grass seed sown. Water was introduced by laying 36½ feet of 1¾-inch galvanized-iron pipe. A wire fence was erected at the four corners and a border of sod containing 89 square yards laid around the sides of the reservation. The small angle adjacent to this reservation was graded, soiled, and sodded.

Reservation 123, Virginia avenue, Sixth and I streets SE.—Work was commenced in May in restoring this reservation, which was left considerably below grade by the raising of Virginia avenue. Clay was received without expense to the United States, soil spread, and grass seed sown. A border of sod was laid, 231 square yards of sod having been used for the purpose. Fifty-five feet 10 inches of 1-inch lead pipe and 23 feet of 1¼-inch galvanized-iron pipe were laid for irrigating purposes.

Reservation 124, Virginia avenue, Seventh and I streets SE.—Work was also commenced in May for restoring this reservation.

The surface of the ground was plowed and harrowed and is being brought to grade as fast as clay is received. As the grading was completed soil was spread to complete the surface. The water service was extended by laying 125 feet of 1¼-inch galvanized-iron pipe and placing two hose valves therein. The small angle adjacent to this reservation was graded, soiled, and sodded.

Reservation 126, Virginia and Georgia avenues and L street between ninth and Eleventh SE.—This reservation is used as a children's playground. The running path was repaired with new cinders, new faucets placed on the drinking fountain, washouts on the ground filled up with soil, catch basins repaired, and 44 trees planted to replace those that were broken by children or that had made only a poor growth.

Reservation 204, Maryland avenue and B street, between First and Second street NE.—Two park settees and one plant vase were painted.

Reservation 263, Kentucky avenue, Fifteenth and E streets SE.—The entire line of posts in the fence inclosing this reservation was reset.

TREES, SHRUBS, PLANTS, FERTILIZERS, AND SKILLED LABOR FOR THE GROUNDS OF THE LIBRARY OF CONGRESS.

The four large circular beds at the main approaches of the Library Building massed with planting of dwarf evergreeen trees and shrubs were maintained in their usual good condition during the year, such of their number as were injured by the winter months were removed and replaced from the stock of evergreen trees and shrubs belonging to the Library grounds in the Propagating Garden nursery. The margins of these circles were resurfaced with good clover sod, and such of the evergreens as required tying in and restaking were attended to. One hundred and sixty-two cubic yards of well-rotted stable manure was spread over the lawns in the late winter months, and subsequently raked in by workmen employed for that purpose.

One hundred and sixty additional shrubs were planted in the grounds and the groups of shrub plantings were pruned and cared for during the year.

The trees, shrubs, and material purchased during the year for these grounds were as follows:

381 trees and shrubs.
162 cubic yards of well-rotted manure.
105 square yards of clover sod.

TREES, SHRUBS, PLANTS, FERTILIZERS, AND SKILLED LABOR FOR THE GROUNDS OF THE CAPITOL.

The flower beds on the terrace esplanades, north, south, and west of the Capitol (58 in all) were maintained in the best practicable condition from the commencement of the fiscal year, July 1, 1906, until the end of the season, October, 1906. Early in November the palms and tropical foliage and flowering plants, that required winter protection, were removed from the vases and flower beds and placed in the greenhouses at the Propagating Gardens. The earth in the

flower beds was removed and replaced with fresh loam and compost, and the flower beds were planted with dwarf evergreen trees and shrubs for the winter and spring decoration of the terrace esplanades; hardy spring flowering bulbs were subsequently planted bordering the evergreens massed in these beds. Early in May of the present year the evergreen trees and shrubs, etc., used for the winter decoration of the terrace esplanades, were taken up and such of them as were not materially damaged by exposure to severe frost during the winter months were transplanted in the nursery grounds at the Propagating Gardens; the flower beds on these terraces were again prepared for planting, and planted with summer decorative plants. Water lilies were planted in boxes, and gold fish were placed in the fountain basins near the western approaches to the Capitol building and in the grotto ponds in the northwestern section of the grounds.

Skilled workmen were employed as required during the fiscal year, in pruning trees and shrubbery in the grounds east and west of the Capitol, in removing dead branches from the trees, and in the work of planting additional trees and shrubs.

The number of trees, shrubs, plants, etc., purchased during the fiscal year for the plantings in these grounds was as follows:

Trees and shrubs	2,077
Palms and tropical plants	132
Spring flowering bulbs	8,900
Herbaceous plants	200

Planted in flower beds and vases for summer decoration 14,132 miscellaneous flowering and foliage plants.

Planted in flower beds and vases for winter decoration 1,441 over-dwarf trees, shrubs, and vines.

Planted in the east and west parks during the year 200 deciduous trees and shrubs.

BAND CONCERTS.

The concerts by the Engineer Band from the Washington Barracks and the Cavalry Band from Fort Myer, which, with the approval of the Secretary of War, were inaugurated in the summer of 1904, were resumed in June, 1906, continued until the end of September, 1906, and again commenced in June, 1907. The concerts were given on Mondays, Tuesdays, Thursdays, and Fridays. From July 1 to September 14, 1906, and in June, 1907, the concert hours were from 7.30 to 9 p. m., and from September 17 to 28, 1906, they commenced one and one-half hours before sunset and terminated at sunset.

Concerts were given in the following-named parks during the year:

Judiciary Park.—July 2, 6, 12, 17; August 2, 10, 16, 23, 30; September 6, 13, 20, 25, 1906; June 11, 18, 25, 1907.

Garfield Park.—July 3, 10, 23; August 7, 27; September 21, 1906; June 3, 13, 1907.

Lincoln Park.—July 5, 27; August 9, 21; September 3, 14, 27, 1906; June 6, 14, 1907.

Franklin Park.—July 9, 24; August 6, 20; September 7, 18, 1906; June 17, 28, 1907.

Smithsonian grounds.—July 13, 19; August 3, 13, 28; September 4, 17, 28, 1906; June 4, 10, 24, 1907.

Iowa Circle.—July 16, 26, 31; August 17, 31; September 10, 1906; June 20, 1907.
Washington Circle.—July 20, August 14, September 11, 1906; June 7, 21, 1907.
Dupont Circle.—July 30, August 24, September 24, 1906; June 27, 1907.

To accommodate the bands, a portable band stand, consisting of trestles and a platform in sections, and camp stools were provided, and they were hauled to the park the day of the concert and removed therefrom the day following. Lamps were provided at the night concerts, so that the musicians could read the music. Ice water was also provided for the comfort of the members of the bands.

In addition to the concerts mentioned above, the usual Wednesday afternoon concerts in the Capitol grounds and the Saturday afternoon concerts in the White House grounds were given by the Marine Band from July 1 to September 30, 1906, and in June, 1907.

PROPAGATING GARDENS, INCLUDING GREENHOUSES AND NURSERY.

The various greenhouse structures were maintained in good condition, and the plants in them were given necessary care and attention. Woodwork was repaired and painted, broken glass replaced with new glass, and the glass roofs of some of the houses were reputtied. Repairs were made to boilers and heating pipes. Three worn-out boilers that had heated five of the houses were removed and another boiler placed in position to heat one of the houses. One house was reglazed. One other old boiler that heated two houses was also removed, a large new boiler was purchased and set and connected with the pipes of six greenhouses, all of which it will heat. A brick smokestack was built for the service of this new boiler. A 1-horsepower electric motor was installed and connected with the electric-power wire that supplies the shops building. The motor was for use in operating a small pump.

In the nursery grounds, lawns were mown, edged, and raked, the trees, shrubs, and flowering stock cared for, weed growth removed, and the grounds maintained in a neat condition.

This Office is frequently in receipt of requests for the loan of plants from the gardens for the use of churches, fairs, festivals, etc., and requests are often made for flowering and decorative plants for private purposes.

All such requests have to be declined, as either the loan or gift of any plants would be in violation of the following extract from the act of Congress, approved June 30, 1878:

> *Provided*, That hereafter only such trees, shrubs, and plants shall be propagated at the greenhouses and nursery as are suitable for planting in the public reservations, to which purposes only the said productions of the greenhouses and nursery shall be applied.

In addition to the plants (over 1,000,000) propagated at these gardens for the reservations under the charge of this Office, there were also propagated over 44,000 plants for other departments of the Government. After those were supplied the surplus remaining (about 15,000) were distributed to hospitals, Government offices, and to whoever asked for them. Appended hereto is a list showing the stock

grown, purchased, planted in the parks, and distributed during the year:

List of stock propagated, purchased, planted, and distributed.

	Number.	Kinds.	Number of varieties.
PROPAGATED.			
Plants for stock and plant planting	969,649	49	129
Plants for greenhouses, nursery, and fall planting	56,900	28	175
Plants for grounds for Treasury Department	890	5	7
Plants for grounds of State, War, and Navy Departments	1,700	6	9
Plants for grounds of United States Capitol	14,000	(a)	(a)
Plants for Bureau of Engraving and Printing	1,296	(a)	(a)
Plants for Washington Aqueduct	671	(a)	(a)
Plants for Washington Barracks	600	(a)	(a)
Plants for filtration plant	1,700	(a)	(a)
Plants for Fort Myer	150	(a)	(a)
Plants for Census Office	3,000	(a)	(a)
Surplus stock distributed as follows:			
Columbia Hospital	500	(a)	(a)
Garfield Hospital	500	(a)	(a)
Emergency Hospital	500	(a)	(a)
Freedmen's Hospital	500	(a)	(a)
Sibley Hospital	500	(a)	(a)
Providence Hospital	500	(a)	(a)
National Homeopathic Hospital	500	(a)	(a)
Casualty Hospital	500	(a)	(a)
Children's Hospital	500	(a)	(a)
Episcopal Eye, Ear, and Throat Hospital	500	(a)	(a)
Little Sisters of the Poor	500	(a)	(a)
Public Schools	720	(a)	(a)
Fire Department	2,880	(a)	(a)
General public	10,000	(a)	(a)
Total	1,069,656	.....	.....
PURCHASED.			
Hardy flowering bulbs	31,000	3	16
Tender flowering bulbs	16,000	3	3
Plants	625	19	26
Trees	610	10	19
Shrubs	3,190	20	45

[a] General stock.

Grown in greenhouses for autumn, winter, and spring bloom:	
Chrysanthemums	4,000
Carnations	5,000
Heliotrope	300
Poinsettias	250
Roses	4,300
Smilax	1,000
Violets	1,800
Primulas	600
Stevia	1,400
Tropical plants	13,000
Potted and boxed for winter forcing:	
Roman hyacinths	10,000
Narcissus	3,000
Lily of the valley	3,000
Planted at propagating gardens:	
Asters	2,000
Aloysia	100
Cannas	100
Cosmos	600
Dahlias	150
Gladiolii	1,000
Heliotrope	300
Tuberoses	2,000
Miscellaneous	9,000
Planted in various reservations, including east and west Potomac Park:	
Trees	869
Shrubs	2,339
Planted in propagating gardens for stock:	
Trees	31
Shrubs	851
Planted in parks for spring bloom:	
Bulbs	31,000
Pansies	10,000
Sent out to parks in May and June:	
Bedding plants	960,649
Tropical plants	9,000
Vases stocked:	
Vases	20
Plants	570
Fountains stocked:	
Fountains	9
Water lilies	100

Storehouse and shops building, Propagating Gardens.—The tools, supplies, and other Government property in the storehouse were cared for. The gutters on the building were repaired.

A sale of old, unserviceable, and condemned materials and tools was had in March, 1907, and the gross proceeds thereof, amounting to

$1,028.55, deposited in the Treasury of the United States. Of this amount, $183 was for property belonging to the Washington Monument.

At the shops building 200 feet of old 6-inch galvanized iron gutter was removed and replaced with new gutter.

SETTEES, TOOLS, MANURE, REPAIR OF POST-AND-CHAIN FENCES, AND REMOVING SNOW AND ICE.

During the year 551 park settees were painted, others were repaired, and all loose settees in the parks were refastened to the ground by stakes.

Repairs were made to lawn mowers, wheelbarrows, and miscellaneous tools, edge tools sharpened and kept in good order, and new tools purchased from time to time as required.

There were purchased 724 cubic yards of stable manure, and this, with manure received from Government stables, was piled in the compost grounds at Nineteenth and B streets NW. About 1,454 loads of this manure, when well rotted, were hauled out to the various parks in December, 1906, and spread over the lawns. In the spring this manure was raked in and the refuse removed.

The iron post-and-chain fences inclosing nine of the triangular reservations were taken down and replaced with copings of cement concrete. The iron post-and-chain fence around a small triangle on Rhode Island avenue between Ninth and Tenth streets was also taken down as no longer necessary, as the ground is inclosed with a stone curbing laid by the District government. Posts in the fences that were out of line were straightened and new iron caps were placed on 125 iron fence posts to replace those that were broken or missing. These new caps were painted.

The snow and ice were removed as soon as possible after storms from the walks around and through the various parks and park places. Where through freezing the snow could not readily be removed, sand was sprinkled and the slush and dirt removed as soon as a thaw set in. There were in all seven falls of snow during the period from January 16 to March 10. The annual allotment of $1,200, made for removing snow and ice, was practically exhausted by January 5, and thereafter it was necessary to use funds from other items of appropriation, which, while applicable to the work, were yet needed for other purposes. On February 6 a letter was written to the Chief of Engineers recommending that Congress be asked to make an appropriation of $2,000 for the purpose of reimbursing the items above mentioned for the amounts taken from them and also for removing snow and ice during the remainder of the season. Additional funds were, however, not granted. The total amount expended during the season was $2,224.37, which was $1,024.37 in excess of the regular allotment.

PAINTING LODGES, IRON FENCES, AND VASES.

The exteriors of two park lodge houses, the interiors of three, some iron posts and bars in Judiciary Park, the iron post and bar fences inclosing 11 reservations, the iron post and chain fence inclosing Stanton Park, some iron posts and chain in the Smithsonian grounds, and the iron posts and *chain fences* inclosing 30 reservations, a total

of 2,206 posts, 5,451 feet of bars, and 11,314 feet of chain were painted.

WATER PIPES, DRAIN PIPES, AND FOUNTAINS.

Repairs were made to water pipes and valves where necessary and new valves put on. In the autumn the water was shut off from the various parks, the hose valves removed and taken to the shops at the nursery and repaired during the winter. In the spring the valves were replaced on the pipes and the water turned on. During the year the following additional water pipe was laid in the parks as mentioned elsewhere in this report: Four thousand nine hundred and seventy-four feet of 6-inch cast-iron pipe, 100 feet of 4-inch cast-iron pipe, 2,343 feet of 3-inch cast-iron pipe, 5,945 feet of 2-inch galvanized-iron pipe, 7,466 feet of 1¼-inch galvanized-iron pipe, and 218 feet of 1-inch lead pipe, being a total of 21,046 feet.

Stoppages were removed from drain pipes in the public grounds and repairs made to broken pipes as required. The following quantities of additional drain pipe were laid during the year: Four hundred feet of 10-inch terra-cotta pipe, 622 feet of 8-inch terra-cotta pipe, 2,210 feet of 6-inch terra-cotta pipe, 64 feet of cast-iron drain pipe, and 337 feet of miscellaneous terra-cotta pipe, being a total of 3,647 feet. Sixty-six additional brick catch basins were constructed.

The large fountains and their jets were cleaned weekly, except during the winter. Repairs were made to their basins, supply and overflow pipes and valves, and new overflows and valves put on where needed. Six of the iron fountains were painted. The water was shut off for the winter as usual, the jets taken off and kept in the storehouse until spring, when they were replaced and the water turned on.

Necessary attention was paid to the drinking fountains, stoppages removed from their waste pipes, their supply pipes and valves repaired, and new ones put in where needed. New tinned dippers were put on where needed and two of the fountains were painted. The water was turned off for the winter months.

LIGHTING THE PUBLIC GROUNDS.

The following parks are lighted with arc electric lights:

	Lights.		Lights.
Executive Mansion grounds	5	Lafayette Park	6
President's Park	9	Propagating Gardens	6
Monument Park	12	Seventeenth street driveway in Monument Park Annex	17
Franklin Park	9		
Judiciary Park	9		
Lincoln Park	8	Total	81

The lamps on the Seventeenth street driveway in Monument Park Annex were erected during the year. The conduits for the cables were laid in August and September, but the cables were not run and the poles for the lamps erected until November, owing to a delay in getting the poles from the foundry. The lamps were tested on November 26 and their lighting under the contract commenced on November 27. Owing to a change that had to be made in the location of the south end of the driveway, and which could not be effected until the

summer of 1907, only 17 of the 27 lamps provided by Congress for the driveway could be erected during the fiscal year. The remaining 10 poles and lamps will be erected as soon as the changes in the driveway now under way are completed.

The number of gaslights in the public grounds not connected with meters lighted during the year was 226. All these lamps are equipped with mantle burners of high candlepower. The company which had the contract for the year did not complete their equipment until August 31. The old contractors held over and lighted the parks from July 1 until August 31 at the rate prescribed by Congress for the service.

Two gas lamp-posts without lanterns or burners standing on the line of Reservation 28, at Pennsylvania avenue, Twenty-first, and I streets NW., were taken down and removed to the property yard at the nursery. These lamps have not been in service for a long period, having been replaced by lamps erected on the sidewalk curb by the District government.

Two lamp-posts and lamp on the sidewalk at the southeast entrance to the White House grounds were discontinued and taken down, and were replaced by an electric light erected by the District government.

REPAIR OF ASPHALT PAVEMENTS.

The following tabulated statement shows the area of asphalt roadway and foot-walk pavements constructed and repaired during the

Location.	New work on roadways.	New work on walks.	Repairs to roadways.	Repairs to walks.
	Sq. yards.	*Sq. yards.*	*Sq. yards.*	*Sq. yards.*
Dupont Circle				825
Farragut Park				135
Franklin Park				760
Judiciary Park	1,233			35
Lafayette Park				10
Lincoln Park				150
McPherson Park				35
Smithsonian grounds			5,615	
Stanton Park		88.7		
Total	1,233	88.7	5,615	1,950

In addition to the foregoing, 1,746 square yards of concrete walks were laid in Judiciary Park at the northeast, north, and northwest sides of the Pension Office building, a cement walk about 3,000 feet long and covering an area of 2,139 square yards was laid around the borders of the great ellipse in the President's Park, and 265 square yards of cement walks were laid in other portions of the public grounds.

STATUES.

There are now 25 statues in the public grounds under the charge of this Office and 10 in contemplation.

Lists of all but four of these statues were printed in the Annual Reports of this Office for 1903 and 1904. The four not included in those lists are, first, a statue to the memory of Commodore John Barry, for which the sum of $50,000 was appropriated by act ap-

proved June 8, 1906 (Public, No. 206); second, a statue to the memory of John Paul Jones, for which $50,000 was appropriated by act approved June 8, 1906 (Public, No. 208); third, a statue of Longfellow, to be provided by the Longfellow Memorial Commission, Congress having appropriated the sum of $4,000 for a pedestal for it by public resolution approved June 8, 1906 (Public, No. 25); and fourth, a suitable memorial to the memory of Christopher Columbus, for which $100,000 was appropriated by act approved March 4, 1907 (Public, No. 267).

Attention has been paid to the various statues during the year and the pedestals and bronze figures have been maintained in a cleanly condition so far as possible. One statue, that of Gen. George B. McClellan, was erected and completed during the year.

MEMORIAL TO GEN. ULYSSES S. GRANT.

An additional appropriation of $40,000 was made by sundry civil act approved June 30, 1906, to continue work on the memorial, making $90,000 which has been appropriated of the $240,000 fixed by Congress as the price for the memorial.

On December 29, 1906, the contractors, who are also the sculptor and architect, were paid for the full-size models of the bronze lions for the memorial, which had been approved by the Commmision in October.

By resolution passed at its meeting held December 5, the Memorial Commission provided that a committee be appointed to determine the exact location in the Botanic Garden where the memorial is to be placed, the elevation to be given it, and the treatment to be accorded the site. This committee consisted of five members—the executive and disbursing officer of the Commission, the sculptor, the architect of the memorial, a prominent architect, and a prominent landscape architect. This committee held two meetings, one on January 10 and one on February 3, and submitted its reports to the Commission early in May.

STATUE OF GENERAL M'CLELLAN.

In August the plants and shrubs were removed from the site selected for the statue (United States reservation 303, at Connecticut and California avenues and Columbia road) in order to clear the ground for the contractor who was to erect the pedestal. The concrete foundation for the pedestal was commenced on September 18 and completed on September 29. The bronze equestrian group arrived in Baltimore from France on October 1 and in Washington in November. The bronze embellishments for the pedestal were also delivered in Washington in November. The granite steps to form the base of the pedestal commenced to arrive on December 13, work began setting them on December 23, and by January 11 all of the steps on hand had been set. This included part of the fourth course. The delivery of the granite for the pedestal commenced March 20, and setting was begun the following day. It was completed April 6. The bronze equestrian group was erected on the pedestal April 11. The work of placing the other bronze work in position was completed April 19, and the bronze lettering was commenced April 18 and

VIEW OF THE McCLELLAN STATUE, AS COMPLETED.

VIEW OF THE McCLELLAN STATUE (VEILED) AND STANDS.

Opening of the exercises.

VIEW OF THE McCLELLAN STATUE.

Beginning of the unveiling, flags receding.

VIEW OF THE McCLELLAN STATUE UNVEILED.

Flags forming a background during the firing of the salute.

VIEW OF THE McCLELLAN STATUE UNVEILED.

Flags raised over the stands of the President and Society of the Army of the Potomac.

finished April 20. The pointing of the joints of the pedestal was completed by April 24, which completed the monument in accordance with the contract, except that the date for completion was fixed by the contract at December 19, 1906. It was represented by the subcontractors for the pedestal that they were delayed by numerous unforeseen causes from getting that work done in time. A reproduction of a photograph of the completed statue accompanies this report.

In sundry civil act approved June 30, 1906, Congress appropriated the sum of $2,500 for defraying the expense connected with the unveiling of the statue. The work incident to these ceremonies was performed by this Office, such as erecting viewing stands (under contract) around the site, decorating them, sending out invitations, providing seating for the guests, and preparing and printing programmes of the exercises. The unveiling took place with impressive ceremonies on the afternoon of May 2, 1907. Reproductions of five photographs of the unveiling ceremony at its different stages accompany this report.

The design for the actual unveiling of the statue was unique in conception, and was so successfully carried out, as will be seen from the photographs, that it further exemplifies the principle first applied at the unveiling of the Sherman statue in 1903, namely, that it is better not to allow the American flag to fall to the ground when the statue is uncovered (as has been the custom), but to carry it aloft and have it wave out above the statue during the remainder of the exercises. This scheme for the unveiling was approved by Col. Charles S. Bromwell, in charge of the ceremonies, and was conceived and carried out by Mr. Frederick D. Owen, of this Office, with the assistance of a boatswain and five sailors from the Washington Navy-Yard, who manipulated the ropes. The plan has proved so attractive and so appropriate a form of unveiling that it is believed it will be adopted by others upon similar occasions.

After the ceremonies were concluded the stands were removed in due course, the site cleaned up, and preparations made for improving it. This work was completed in June, and is as follows: A cement coping 339½ feet long was constructed around the reservation and a cement sidewalk laid outside of the coping and between it and the curbstone. This sidewalk covers an area of 93½ square yards. The reservation was graded with clay received without expense, covered with soil, and its entire area (about 482 square yards) sodded. The funds for the improvement of the site were generously provided by the Society of the Army of the Potomac, as there was no appropriation available for the work.

STATUE OF GEN. PHILIP H. SHERIDAN.

At a meeting held on December 24, 1906, the Statue Commission passed a resolution rejecting the model of the statue submitted by the sculptor who was invited many years ago to make it, and by a subsequent resolution adopted May 4 the Commission authorized the Secretary of War, one of its members, to instruct the officer in charge of Public Buildings and Grounds, who is also the executive and disbursing officer of the Commission, to secure an artist to provide a statue, the same being subject to the approval of the Secretary. In obedience to this order, this Office has been in correspondence with leading sculptors in regard to submitting a model for the statue.

STATUE OF GENERAL COUNT PULASKI.

As stated in Annual Report for the fiscal year ending June 30, 1906, the sculptor who had been given permission to submit a model by June 1, 1906, was given an extension of time to December 1, 1906. He reported on November 30 that his model was completed in plasteline and in his studio in another city, ready for inspection. The Commission required him, however, to submit his model in plaster in this city, and it arrived here on February 9, 1907. The Commission approved the model on February 20, subject, however, to further consideration after a report was received from a committee of artists who were invited by the Commission to advise it as to the merits of the model. The committee inspected the model and submitted its report to the Commission. A contract has not yet been entered into for the construction and erection of the statue.

STATUE OF GENERAL BARON VON STEUBEN.

On January 10, 1907, a contract was entered into by the Statue Commission with the sculptor whose model was selected in May, 1906. On February 28 the plaster copies of the sketch models, which the contract provides shall be furnished the Commission by him, were received, and the first and second payments due him under the contract were made the same day. The working model of the statue was completed in May, and photographs of it were received from the sculptor and submitted to the Commission on May 24 for approval.

STATUE OF GEN. THADDEUS KOSCIUSKO.

The joint resolution of Congress approved April 18, 1904, accepted the offer of the Polish-American organizations and the Polish-American people of the United States generally, to present a statue to General Kosciusko, to be erected in the northeast corner of Lafayette Park.

The committee representing those organizations and peoples invited competition for the statue, and models were received in Washington in December, 1906, from the artists who entered the competition. The Commission which the joint resolution provides shall approve the statue on behalf of the United States, viewed the models, recommended that one of them be accepted, and that recommendation has been approved by the committee mentioned.

STATUE OF THOMAS JEFFERSON.

Sundry civil act approved April 28, 1904, created a commission, composed of the Secretary of State, the chairman of the Committee on the Library of the Senate, and the chairman of the Committee on the Library of the House of Representatives of the Fifty-eighth Congress, to select a site on the public grounds of the District of Columbia for a statue of Thomas Jefferson, and appropriates the sum of $5,000 to procure plans for the same. At the request of the Secretary of State, the officer in charge of this Office will act as executive and *disbursing* officer of the Commission.

STATUE OF JOHN PAUL JONES.

Congress, by act approved June 8, 1906 (Public, No. 208), appropriated the sum of $50,000 for the erection in the city of Washington of a statue to the memory of John Paul Jones, and created a commission, of which the Secretary of War is the senior member, to select a site for the statue on ground belonging to the Government other than the grounds of the Capitol or Library of Congress. So far as known to this Office no action has yet been taken for the selection of a site or for the erection of the statue.

STATUE OF COMMODORE JOHN BARRY.

Congress, by act aproved June 8, 1906 (Public, No. 206), appropriated the sum of $50,000 for a statue to the memory of Commodore Barry, to be erected on ground belonging to the United States in this city. At the second meeting of the Statue Commission, of which the Secretary of War is the senior member, held on February 20, 1907, the officer in charge of Public Buildings and Grounds, who is the executive and disbursing officer of the Commission, was instructed to prepare a programme of competition and submit it to the Commission. This programme was prepared and transmitted to the secretary of the Commission during the early part of the month of March, 1907.

STATUE OF LONGFELLOW.

The joint resolution of Congress approved June 8, 1906 (Public, No. 25), apropriated the sum of $4,000 for the preparation of a site and the erection of a pedestal for a statue in bronze of the late Henry Wadsworth Longfellow, to be provided by the Longfellow National Memorial Association. The Commission created by that act, of which the Secretary of War is a member, was authorized to select and prepare a site and erect the pedestal, held its first meeting on December 24, 1906, at which the officer in charge of this Office was appointed its executive and disbursing officer. At its second meeting, held on January 29, 1907, the Commission selected as a site for the statue United States Reservation No. 150, at the intersection of Connecticut avenue, Eighteenth, and M streets NW.

MEMORIAL TO CHRISTOPHER COLUMBUS.

By act approved March 4, 1907, Congress appropriated the sum of $100,000 for the erection in this city of a suitable memorial to Christopher Columbus, and created a commission, of which the Secretary of State and the Secretary of War are members, with authority to select a site and a suitable design, and to contract for and superintend the construction of the memorial.

At a meeting held by the Commission in the office of the Secretary of State on May 18, the Secretary of War was elected chairman of the Commission, and the officer in charge of Public Buildings and Grounds its executive and disbursing officer. By direction of the Commission this Office has since then been in correspondence with several leading American and foreign sculptors in regard to the submission by them of a design and a small model of the proposed statue for the consideration of the Commission.

DEPARTMENTAL TELEGRAPH LINE.

This is an overhead line, with the exception of three short sections, which are underground. The line of overhead wires consists of 76 poles, covering a distance of about 3 miles, with a length of 14 miles of wire. The line starts from the Lemon Building (1729 New York avenue), where the main storage operating battery is located, and runs overhead to the corner of Seventeenth and G streets, thence underground by 250 feet of 20 conductor cable into the State, War, and Navy Departments building, thence to the White House and the Treasury Department building, and thence by 4,600 feet of 10 conductor cable underground to Fourteenth and G streets NW., and down Fourteenth to B street NW., entering the Department of Commerce and labor en route. From Fourteenth and B streets NW. the line runs overhead on poles of the Western Union Telegraph Company to Twelfth and B streets and over to the Post-Office Department building, returning by a loop into the Department of Agriculture, and thence back to the cable pole at Fourteenth and B streets. From the Treasury Department there is an underground connection by 1,300 feet of 6 conductor cable up Fifteenth street to a pole in alley between H and I, and from thence by aerial cable to the Department of Justice on K street near Fifteenth street. From Fourteenth and G streets NW. the line runs overhead along G street to Eighth into the Interior Department, thence to H to North Capitol street into the Government Printing Office, thence south on North Capitol street to B street north, and thence by 500 feet of 13 conductor cable underground into the Capitol building. Connected with the main overhead line on H street there is a short line down an alley between Fifth and Sixth and G and H streets into the Pension Office building.

There are 15 local offices on the line, each having two circuits and two sets of instruments. Each office has a local battery, except the Interior Department, which has box instruments. The main battery in the Lemon Building consists of two sets of storage batteries of 50 cells each.

During the year the main and local batteries received necessary attention and were maintained in good working order. All crosses and other obstructions on the wires of the line were removed as soon as possible, instruments maintained in good condition, and necessary repairs made to the line wires.

The instruments belonging to the offices in the United States Senate and the House of Representatives, which had been stored during the recess of 1906, were replaced upon the operators' tables in time for the opening of Congress in December of that year and removed therefrom when Congress adjourned on March 4, 1907, and will be carefully stored during the recess.

Four old wires formerly used for the automatic telephone service between the Departments, on the departmental telegraph poles on G street between Ninth and Fourteenth streets NW., were removed and one cross arm on each of the poles was taken down. A 10-wire aerial cable running from the pole at southwest corner of Ninth and G streets to and over the roof of the Interior Department building was also taken down, being no longer needed. Six cross arms were placed on the poles of the Western Union Telegraph Company along *B street south* from Fourteenth to Thirteen-and-a-half streets, and 4

wires strung on them from the cable pole at southwest corner of Fourteenth and B streets SW. to Thirteen-and-a-half street, and thence to the roof of the Department of Agriculture, in order to connect that Department with the underground system at Fourteenth and B streets SW. All of the old poles, 9 in number, and overhead wires along Fourteenth street on the border of the Monument grounds were taken down from B street north to B street south. To make the change from overhead to underground along Fourteenth street the Western Union Telegraph Company gave the use of 4 conductors in the cable in their conduit from B street north to B street south until such time as funds are provided for the purchase of cables for the departmental lines.

All poles of the line were tested and 5 found unsound at the base. These were cut off at the butt, reset, the old stumps pulled out, and the sidewalks around them repaired. A new cable box was installed in the northwest corner of the subbasement of State, War, and Navy Departments building and about 500 feet of new covered wire run from the box to the telegraph office in War Department. About 75 feet of old and worn-out cable and about 1,000 feet of old covered wire were removed and all working wires put up in good order. The old cable box was disconnected and removed. All wires running from the roof of the Winder Building at Seventeenth and F streets NW. were pulled up and the slack cut out. Sixteen new cells of Gordon batteries were installed for local use in the several Executive Departments, etc., taking the place of the old style gravity batteries in use for many years, and which, owing to constant evaporation in warm buildings, are quite troublesome to keep in good working order.

The telegraph office in the Government Printing Office was moved into another room at the request of the chief clerk of that office. All the necessary wires were run and connections made for making the change.

OLD LAND RECORDS OF THE CITY OF WASHINGTON.

The act of Congress approved March 3, 1896, authorized and directed the Secretary of War to correct the records of the Department in respect of certain lots in the city of Washington. The old records referred to are the old land records in this Office, and between the date of the act and June 30, 1907, they have been corrected in the cases of 23 of the lots.

EXTENSION OF BUILDINGS BEYOND THE BUILDING LINES IN THE CITY OF WASHINGTON.

The act of Congress approved March 3, 1891 (Vol. 26, Stat. L., 868), as amended by the Act approved June 2, 1906 (Public No. 26), provides for the approval of the Secretary of War on applications for projections on buildings that are to be erected on lots adjoining United States public reservations.

By direction of the Secretary of War this Office is charged with the duty of investigating and reporting upon these cases. During the fiscal year ending June 30, 1907, only one application of that character has been referred by the War Department and reported upon by this Office. In that case, as some of the projections applied for would encroach upon a Government reservation, it was recommended that the application be not approved.

RESERVATIONS WHICH ARE THE PROPERTY OF THE UNITED STATES OCCUPIED, IT IS BELIEVED, IN VIOLATION OF LAW.

[See map in Annual Report for 1894.]

The following reservations, the property of the United States, are now occupied, it is believed, without authority of law:

Reservation No. 186, by the Bethany Chapel of the New York Avenue Presbyterian Congregation.

Reservation No. 249 is occupied as a lumber yard by a man who claims to rent it from a man in Port Deposit, Md.

Reservations Nos. 137, 138, 152, 164, and 169 have been inclosed with iron or wire fences and partially improved by the owners of adjacent property.

The following also are improved and utilized by adjacent property owners: Nos. 61, 65, 67, 139, 141, 142, 143, 161, 162, 167, 168, 175, 208, and 284.

Reservations 61, 141, and 142, above mentioned, are occupied under permits granted the owners of the adjacent property by the Chief of Engineers, under authority of the act of Congress approved July 1, 1898.

In addition to the foregoing there is a valuable piece of United States ground, known as reservation No. 94a, lying between Rock Creek and Twenty-eighth street west, between I and K streets north, of which certain persons are now in lawful occupation. This Office has for several years been making efforts to secure possession of the property, which have so far proved unsuccessful. This case is reported upon on page 3929 of the Annual Report of the Chief of Engineers for 1904.

MONUMENT AND WHARF AT WAKEFIELD, VA., THE BIRTHPLACE OF WASHINGTON.

In addition to the usual care extended by the United States watchman in charge, he has kept the grass within the iron fence around the monument cut.

As heretofore reported, the wharf was badly damaged in February, 1897, by a violent storm and extensive ice jam, and again on February 18, 1905, by ice.

The wharf was built by the United States in 1894, at a cost of $11,000, and was intended as a landing place for steamers carrying visitors to the monument. In its present damaged condition it is useless for that purpose, and the estimates submitted in my last annual report for its repair are again submitted and recommended.

UNITED STATES WHARF PROPERTY, WASHINGTON, D. C.

By act of Congress approved March 3, 1899, entitled "An act relative to the control of wharf property and certain public spaces in the District of Columbia," the following-described property is placed under the immediate jurisdiction and control of the Chief of Engineers of the United States Army:

The banks of the Potomac River from the north line of the Arsenal grounds to the southern curb line of N street south. * * *

By letter of March 11, 1899, from the Office of the Chief of Engineers, this Office was directed, as representative of the Chief of Engi-

neers, to assume control of the said wharf line, and since that date it has been in charge of this Office. No work has been done during the year, as there are no funds available for either the improvement or care of the property.

On August 22, 1906, the Acting Chief of Engineers executed a revocable lease with R. M. Allen & Co. whereby a water lot on this water front opposite lot 10 in square 504 is leased to Allen & Co. with the privilege of erecting a building thereon for use in building, repairing, and storing boats. Consideration, $18.75 per quarter, in advance.

On August 22, 1906, the Chief of Engineers executed a revocable lease with the Corinthian Yacht Club whereby the club is given the use of two water lots on the river front, opposite lots 17 and 18, in square 503, with the privilege of building wooden walk ways around three sides of the water lots for fastening boats and gaining access to them. Consideration, $18.75 per quarter, in advance.

On March 26, 1907, the Chief of Engineers executed a revocable lease with George W. Webber for the use of a wooden building on the south side of Water street, opposite lot 14, square 503, for use as a blacksmith and boiler repair shop. Consideration, $5 per month, in advance.

The following-described leases, made by the Chief of Engineers, are also in force:

June 16, 1903, with Thomas R. Riley for wharf and building thereon at foot of Sixth street, opposite lot 13, square 503. Consideration, $50 per month, in advance.

July 13, 1903, with Edward Whyte for wharf and building thereon between O and P streets, opposite lot 11, in square 504. Consideration, $5 per month, in advance.

September 2, 1903, with Thomas Banks for dock, wharf, and buildings foot of Sixth street, opposite lot 14, in square 503. Consideration, $7.50 per month, in advance.

January 18, 1906, with Corinthian Yacht Club, land and water lot opposite lot 16, square 503, with right to erect a boathouse thereon. Consideration $18.75 per quarter in advance.

The estimates submitted in last annual report, by direction of the War Department, for repairing the old sea wall of this wharf property, are again submitted.

SUMMARY OF WORK DONE DURING THE YEAR.

For convenience of reference a brief summary of the more important items of work accomplished during the year is given, as follows:

Executive Mansion.—Considerable miscellaneous painting done in the rooms on the ground floor and on the second floor. The exterior of the mansion washed down, portions of it painted, and in June, 1907, work commenced for repainting it entire. Increased facilities for washing down the mansion provided by running water pipe provided with valves around the roof balustrade. The East Room, Blue Room, Red Room, and private dining room repainted, the furniture in the first three rooms and in the Green Room refinished, reupholstered, and re-covered. The walls of the Blue Room and the Red Room re-covered with new materials. New window hangings provided for the East Room and Blue Room. In the entrance vestibule, main corridor, and

ushers' room the frames of the furniture refinished, reupholstered, and re-covered with new materials, and new window draperies and new door draperies provided. Extensive alterations were made in the hat-box corridor in East Terrace to better adapt it to the needs of the guests attending functions in the Mansion. The colonnade on the south side of this corridor was arranged to be closed in in winter for use as a passageway between the hat-box corridor and the main corridor on the ground floor of the Mansion. The false wooden beams in the ceiling of the porte-cochere were found to be rotting away and were taken down and replaced with steel frames. This ceiling was replastered, and much other plastering was done on other portions of the ceiling of this terrace where the old plaster had been damaged by leaks through the roof. The terrace was entirely rewired for the electric lights in a much better way than the old one, this being rendered necessary on account of the many grounds in the old wires caused also by leaks. Extensive painting was done about the interior of the terrace, and its exterior was also painted. Owing to the many leaks in the roof of the terrace, the old roof was taken off and replaced with a new roof covering of hydrolithic construction. A new roof covering of similar construction was also placed on the west terrace, and that terrace was rewired for the electric lights, all this work being necessary because of leaks in the old roof covering. A new tin roof covering was placed on the Mansion. Additional fire protection was installed by placing a system of perforated pipes between the floor of the attic and the ceiling of the second floor and connecting them with vertical pipes brought through the walls of the house on the ground floor at the north front and run up the chimneys. Two new fire hydrants were also placed at the south front of the Mansion and connected with the water mains. The old tile floor on south portico was taken up and relaid, and the old flagging pavement on the north portico was taken up and replaced with a new pavement of Indiana limestone. A new asphalt pavement was laid in the north area, and an old asphalt footwalk at the south front was taken up and replaced with a new cement walk. An inventory brought up to date of the public property in the Mansion prepared. Some painting done about the Executive Office building, a new boiler placed in basement, and the attic room rewired for electric lights. Considerable carpentry and painting repairs made about the President's stable. Repairs made to the greenhouse structures, and a new boiler of large size installed to replace smaller boilers.

House where Abraham Lincoln died.—Some repapering was done, and repairs made to the heating apparatus, plumbing, and woodwork.

Ford's old theater building.—Work for installing a new steam boiler in place of an old one, which was commenced in June, was completed in July.

House No. 204 L street NW.—This property sold at public auction on November 28, 1906, under the authority granted by act of Congress approved June 30, 1906.

Washington Monument.—Two equalizing steel arms put in for equalizing the inequal expansion and contraction of the cables, occasioned by wear and changes in temperature. Portions of the iron stairway painted and other minor painting done and repairs made.

Public grounds.—Six additional spaces added to the park system

by the transfer to the Chief of Engineers by the Commissioners of the District of Columbia of six parcels of ground with an aggregate area of 3.068 acres. Two unimproved reservations improved, a macadam driveway constructed along the north and west sides of the tidal reservoir in Potomac Park, and the ground on either side thereof improved. Work commenced and well advanced for constructing a macadam driveway along the river side of sections 1 and 2 of Potomac Park between the inlet to the tidal reservoir and the Seventeenth street sewer canal. Four thousand and sixty-nine feet of cement coping and 24 corner posts constructed around five reservations. Twelve thousand seven hundred and ninety-two square yards of sod laid to restore worn portions of lawn surfaces. The approaches and walks around the Pension Office building in Judiciary Park extensively repaired. Repairs made to gravel roadways and walks. The portion of the main gravel driveway in the President's Park, on the east side of the ellipse, surfaced with broken and crushed trap rock for a length of 950 feet, and a cement walk about 3,000 feet long constructed around the borders of the ellipse. The plantings in this park thinned out by removing trees in overcrowded portions. The filled-in ground over the large public sewer, run by the District government through the Mall, restored to proper condition by grading, soiling, seeding and planting, and the reconstruction of walk and road surface. Satisfactory progress made in filling the low grounds in Potomac Park between B street north and the sewer canal and west of Eighteenth street. Work commenced in June for changing the direction of about 800 linear feet of the river drive in Monument Park Annex, due to change of grade of Fourteenth street near Maryland avenue by the District government, and the opening up of Water street at that point. Work commenced in June for constructing the roadway to be placed along the north side of the railroad embankment, at its foot, in East Potomac Park. About three-quarters of the main asphalt roadway in the Smithsonian grounds, which passes in front of the National Museum and Smithsonian Institution buildings from Seventh to Twelfth streets, resurfaced over an area of 5,615 square yards. Garfield Park divided into two sections by the cutting through it of Second street east by the Commissioners of the District of Columbia. Three reservations on Virginia avenue, between Fourth and Seventh streets, restored to proper grade and condition, the work being made necessary by the changes made in Virginia avenue by the Commissioners of the District of Columbia in connection with the elimination of grade crossings. Five hundred and fifty-one park settees painted; 1,454 loads of well-rotted stable manure spread over park lawns. Five park lodges and 2,206 iron posts, 5,451 feet of iron bars, and 11,314 feet of iron chain in park fences painted. Twenty-one thousand and forty-six feet of additional drainpipe laid, 3,131 feet of brick gutters constructed, and 66 additional catch-basins built. Six large fountains and two drinking fountains painted. Seventeen additional electric park lights erected. Twelve hundred and thirty-three square yards of new asphalt foot walk laid, 5,615 square yards of old asphalt roadway and 1,950 square yards of old asphalt foot walk repaired, and 4,150 square yards of new cement foot walk constructed.

Propagating Gardens.—The various greenhouse structures repaired and painted as required. One large new boiler purchased and in-

stalled, displacing old and smaller boilers. The shops building and storehouse maintained in good condition. Over 1,000,000 plants propagated and 269 trees, 2,339 shrubs, 31,000 bulbs, and 979,649 plants planted in the parks.

Statues.—The statue of Gen. George B. McClellan completed, erected, and unveiled. The full-size models of the bronze lions for the Grant Memorial completed. A model for the statue of General Count Pulaski submitted by the selected sculptor and approved. A contract entered into for the statue of General Baron von Steuben, and the working models of the statue completed by the sculptor. A model selected for the statue of General Kosciuszko, which is to be presented to the Government by the Polish-American people of the United States. A site was selected for the statue of Longfellow, which is to be presented by the Longfellow Memorial Association and erected upon a pedestal to be provided by the United States.

Departmental telegraph line.—Improvements and betterments made in the line, and the portion of it on Fourteenth street between B street north and B street south placed underground in conduits of the Western Union Telegraph Company, and the poles and overhead wires there taken down.

Estimates for the fiscal year ending June 30, 1909.

Salaries of employees, public buildings and grounds:		
1 assistant engineer		$3,000
Assistant and chief clerk		2,400
1 clerk of class 4		1,800
1 clerk of class 3		1,600
Clerk and stenographer		1,400
1 messenger		840
Landscape gardener		2,400
Surveyor and draftsman		1,500
Foremen, gardeners, mechanics, and laborers employed in the public grounds		31,200
1 sergeant of park watchmen (policemen)		1,100
1 second sergeant of park watchmen (policemen)		1,050
Day watchmen (policemen) in Franklin Park, Lafayette Park, Smithsonian grounds, Judiciary Park, Lincoln Park and adjacent reservations, Iowa Circle, Thomas Circle and neighboring reservations, Washington Circle and neighboring reservations, Dupont Circle and neighboring reservations, McPherson and Farragut parks, Stanton Park and neighboring reservations, Henry and Seaton parks, Mount Vernon Park and adjacent reservations, greenhouses and nrusery, grounds south of Executive Mansion, Garfield Park, Monument Park, Monument Park Annex (Potomac Park), 21 in all, at compensation as follows:		
1 of class 1	$780	
4 of class 2, at $900 each	3,600	
16 of class 3, at $1,000 each	16,000	
		20,380
Night watchmen (policemen) in Smithsonian grounds, Judiciary Park, Henry and Seaton parks, grounds south of Executive Mansion, Monument Park, Monument Park Annex (Potomac Park), Garfield Park, 10 in all, at compensation as follows:		
2 of class 1, at $780 each	$1,560	
1 of class 2, at	900	
7 of class 3, at $1,000 each	7,000	
		9,460

Salaries of employees, public buildings and grounds—Cont'd.			
Watchman for care of monument and dock at Wakefield, Va., the birthplace of Washington		$300	
1 day watchman (policeman) and 1 night watchman (policeman) for that part of Potomac Park between the causeway of the Pennsylvania Railroad bridge, the Potomac River, and the tidal reservoir, 2 in all, at compensation as follows:			
1 of class 1, at	$780		
1 of class 3, at	1,000		
		1,780	
1 night watchman (policeman) in that part of Potomac Park between the Virginia channel of the Potomac River, the tidal reservoir, and the sewer canal, at compensation as follows: 1 of class 1, at		780	
Night watchmen (policemen) for Stanton and Lincoln parks and 10 adjoining reservations, Lafayette, Franklin, McPherson, and Farragut parks, Washington, Du Pont, Iowa, and Thomas circles, Mount Vernon square and reservations on Massachusetts avenue from Seventh to Seventeenth streets, 4 in all, at compensations as follows:			
1 of class 1, at $780	$780		
1 of class 2, at $900	900		
2 of class 3, at $1,000 each	2,000		
		3,680	$84,670
Contingent expenses, public buildings and grounds:			
For contingent and incidental expenses, including purchase of professional and scientific books and periodicals, books of reference, blank books, photographs, and maps, purchase and repair of bicycles and revolvers for park police and purchase of ammunition			1,000
Improvement and care of public grounds, District of Columbia:			
Improvement and maintenance of grounds south of Executive Mansion		4,000	
Ordinary care of greenhouses and nursery		2,000	
Ordinary care of Lafayette Park		2,000	
Ordinary care of Franklin Park		1,500	
Improvement and ordinary care of Lincoln Park		2,000	
Care and improvement of Monument grounds and annex (Potomac Park) to Monument grounds: *Provided*, That sites may be granted for the erection of boat houses along the banks of the tidal reservoir and the Potomac River, fronting Potomac Park, under regulations to be prescribed by the Chief of Engineers		7,000	
Improvement, care, and maintenance of reservation No. 17 (Garfield Park) and site of old canal northwest of same		2,500	
Construction and repair of post-and-chain fences, repair of high iron fences, constructing stone coping about reservations; painting watchmen's lodges, iron fences, vases, lamps, and lamp-posts; repairing and extending water pipes and apparatus for cleaning them; hose, manure, and hauling the same; removing snow and ice; purchase and repair of seats and tools; trees, tree and plant stakes, labels, lime whitewashing, and stock for nursery, flower pots, twine, baskets, wire, splints, moss, and lycopodium, to be purchased by contract or otherwise, as the Secretary of War may determine; care, construction, and repair of fountains, abating nuisances; cleaning statues and repairing pedestals		18,550	
For improvement, care, and maintenance of various reservations, including purchase, maintenance, and driving of horse and vehicle for official use of the officer in charge of public buildings and grounds, and of other necessary vehicles for official use: *Provided*, That the officer in charge of public buildings and grounds is authorized to erect or permit to be erected temporary structures upon reservations used as children's playgrounds, under such regulations as he may impose		25,000	

Improvement and care of public grounds, etc.—Continued.		
For improvement, care, and maintenance of Smithsonian grounds	$3,000	
For improvement, care, and maintenance of Judiciary Park	2,500	
For laying cement and other walks in various reservations	2,000	
For broken-stone road covering for parks	3,500	
For curbing, coping, and flagging for park roads and walks	2,000	
For establishing, fitting up, and maintaining children's playgrounds	3,000	
For care and maintenance of that part of Potomac Park between the causeway of the Pennsylvania Railroad bridge, the Potomac River, and the tidal reservoir	4,000	
For care and maintenance of that part of Potomac Park along the north and west sides of the tidal reservoir	4,000	
For care and maintenance of that part of Potomac Park extending along the river side between the inlet to the tidal reservoir and the foot of Twenty-sixth street NW	3,000	
For necessary repairs of the approaches and walks in Judiciary Park, abutting the court-house building	3,500	
For continuing improvement of Potomac Park: To continue north B street from Virginia avenue westward to the Potomac River as a park roadway along the northern boundary of Potomac Park according to plans prepared in the Office of Public Buildings and Grounds, to be expended under the direction of the officer in charge of that office, and the jurisdiction over that portion of B street west of Virginia avenue now under the control of the Commissioners of the District of Columbia is hereby transferred to the Chief of Engineers, United States Army	140,000	
For the additional expense of widening the foundations and superstructure of the tidal gates over the inlet to the tidal reservoir in Potomac Park to permit the construction of a roadway over it, to be expended under the direction of the Chief of Engineers, United States Army	25,000	
For paving with asphalt the roadway around the Washington Monument	7,500	
		$267,550
Improvement and care of public grounds:		
For improvement, care, and maintenance of grounds of Executive Departments	1,000	
For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Library of Congress as may be requested by the superintendent of the Library building	1,000	
For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Capitol as may be requested by the Superintendent of the Capitol building	3,000	
For improvement and maintenance of Executive Mansion grounds (within iron fence)	4,000	
For the employment of an engineer by the officer in charge of public buildings and grounds	2,400	
For purchase and repair of machinery and tools for shops at nursery, and for the repair of shops and storehouse	1,000	
		12,400
Repairs, fuel, etc., Executive Mansion:		
For ordinary care, repair, and refurnishing of the Executive Mansion, and for the purchase, maintenance, and driving of horses and vehicles for official purposes, to be expended by contract or otherwise, as the President may determine	35,000	
For fuel for the Executive Mansion, greenhouses, and stable	6,000	
For care and maintenance of greenhouses	9,000	
For repairs to greenhouses	3,000	
		53,000

Lighting, etc., Executive Mansion, etc.:

For gas, pay of limplighters, gas fitters, and laborers, purchase, erection, and repair of lamps and lamp-posts; purchase of matches and repairs of all kinds; stoves, fuel, and lights for office and office stable, watchmen's lodges, and for the greenhouses at the nursery: *Provided*, That foreach 5-foot burner not connected with a meter in the lamps on the public grounds not more than $18 shall be paid per lamp for gas, including lighting, cleaning, and keeping the lamps in repair under any expenditure provided for in this act, and said lamps shall burn every night on the average from fifteen minutes after sunset to forty-five minutes before sunrise, and authority is hereby given to substitute other illuminating material for the same or less price and to use so much of the sum hereby appropriated as may be necessary for that purpose: *Provided further*, That $4,200 of the foregoing sum shall be paid from the revenues of the District of Columbia and the remainder from the Treasury of the United States: *And provided further*, That not more than $6,000 of said appropriation may be expended for lighting, extinguishing, cleaning, repairing, and painting park lamps of a higher candlepower than those provided for above and not less than 60 candlepower, which lamps shall cost not to exceed $20.85 per lamp per annum, and shall otherwise be subject to the restrictions of this paragraph $19,500

For lighting 6 arc electric lights in the Executive Mansion grounds within the iron fence, at not exceeding $85 per light per annum, which sum shall cover the entire cost to the United States of lighting and maintaining in good order each of said lights 510

For lighting 6 arc electric lights at the propagating gardens at not exceeding $85 per light per annum, which sum shall cover the entire cost to the United States of lighting and maintaining in good order each of said lights 510

$20,520

Lighting public grounds, District of Columbia:

For lighting, arc electric lights in the public grounds, as follows: For 7 in the grounds south of the Executive Mansion; 32 in Lafayette, Franklin, Judiciary, and Lincoln parks; 14 in grounds south of the Executive Mansion and in Monument Park, and 27 in Potomac Park driveway, at not exceeding $85 per light per annum, which sum shall cover the entire cost to the United States of lighting and maintaining in good order each of said lights, in all 6,800

Telegraph to connect the Capitol with the Departments and Government Printing Office:

For care and repair of existing lines 1,500

361,770

Care and maintenance of Washington Monument:

For the care and maintenance of the Washington Monument, namely:

1 custodian, at $100 per month	$1,200	
1 steam engineer, at $80 per month	960	
1 assistant steam engineer, at $70 per month	840	
1 fireman, at $55 per month	660	
1 assistant fireman, at $55 per month	660	
1 conductor of elevator car, at $75 per month	900	
1 attendant on floor, at $60 per month	720	
1 attendant on top floor, at $60 per month	720	
3 night and day watchmen, at $60 per month	2,160	
		8,820

Care and maintenance of Washington Monument—Continued.	
For fuel, lights, oil, waste, packing, tools, matches, paints, brushes, brooms, lanterns, rope, nails, screws, lead, electric lights, heating apparatus, oil stoves for elevator car and upper and lower floors, repairs to engines, boilers, dynamos, elevator, and repairs of all kinds connected with the Monument and machinery, and purchase of all necessary articles for keeping the Monument, machinery, elevator, and electric plant in good order: *Provided*, That no advertisement of any kind shall be displayed nor shall articles of any kind be sold in or around the Monument	$3,000
	11,820
Repairs to building where Abraham Lincoln died:	
For painting and miscellaneous repairs	200
Improvements, birthplace of Washington, Wakefield, Va.:	
For repairs to wharf, damaged by storms of February, 1897, and February, 1905	7,000
Sea wall on Potomac River, between the Arsenal wall and N street SW.:	
For rebuilding the wall its entire length, 1,350 feet	40,000
For rebuilding only that part of the wall in front of reservation occupied by Naval Reserves, District of Columbia, 242 feet	7,500
For rebuilding only that part of the wall in front of the reservation occupied by Light-House Board and south to the Arsenal wall, 358 feet	10,800

As some of the preceding estimates are larger than amounts heretofore appropriated, and as some of them are new, the following explanations thereof are submitted:

1. I have asked for an increase in the pay of the assistant engineer from $2,400 to $3,000 per annum. The present compensation of the gentleman who occupies this position is not an adequate one for his duties and responsibilities. He superintends the work performed by the large force of foremen, mechanics, and laborers employed in care of the parks and in the prosecution of new work. He is charged with the preparation of estimates and specifications for new work and consultation of plans for same. He is in charge of the force of mechanics and laborers at the White House and supervises the work for the repair, betterment, and refurnishing of that building. He also exercises supervision over the force employed at the Washington Monument and the work of repairs and improvement there, and also makes monthly inspections of the buildings, twelve in number, occupied as offices by the War Department, other than the State, War, and Navy Departments building, so far as their preservation, care, and safety are concerned. His experience with workmen and his knowledge of the amount of work they should perform results in the work being done in a better and more economical manner than would be the case with a man of less ability and experience, and this, of course, means a saving to the Government. There is no doubt but that a private firm or a corporation would pay more than $3,000 per annum to an employee of his capability and having his responsibilities. In fact, he has been offered that salary by a private concern, and there seems to be no good reason why the Government should pay less.

2. I have asked for an increase of $150 per annum in the pay of the first sergeant of park police. The duties of this officer are as exacting and onerous as those performed by the sergeants of Metropolitan police, while the pay of the latter is $1,250 per annum.

3. I have asked for a second sergeant of park police, at $1,050 per annum. The one sergeant now in charge is overworked. During the day he has to ride on his bicycle over the whole city, inspecting every park policeman, and also inspecting the outlying reservations not looked after by the park policemen. He has to come to this Office every morning to make his report and receive instructions; he has to spend several hours a day at the police court several times a week, and in addition he has to inspect the night policemen in the parks three times a week. There should be a second sergeant to assist him.

4. I have asked for an increase in the pay of the park policemen and the establishment of three grades, viz, those who have served less than three years to receive $780 per annum, those who have served over three years and less than five years to receive $900 annum, and those who have served over five years to receive $1,000 per annum.

The Washington park policeman is probably the poorest paid man in the United States who has police duty to perform. He has practically the same duties as the Metropolitan police. The same intelligence and physical qualifications are required of him. His moral character must be good; his discipline is much the same. He has as many arrests to make as the average policeman. He runs the same risks as to injury from vicious people as the man doing duty on the street. His duties are more exacting, as half of his duty hours are spent in cautioning people about violating the rules of the park and in looking after children. He has a uniform to buy once a year in order to look neat, yet the pay of these policemen is only $60 per month. The city government requires the street railway companies to pay their crossing police officers $75 per month for a great deal less exacting and laborious duty. The lowest grade on the Metropolitan police force receive $75 per month; the officers who serve three years faithfully receive $90 per month, while those who have served five years receive $100 per month. For these reasons the increase in pay asked is strongly recommended. It is also recomended that the designation of these employees be changed from park watchman to park policeman, as that designation indicates more clearly the duties they perform.

5. I have requested an increase of $300 in the appropriation for "Contingent expenses, public buildings and grounds," for use in the purchase and repair of bicycles and revolvers for the park police and the purchase of ammunition.

The use of bicycles by those members of the force who have outlying reservations in addition to larger parks to patrol is found to add largely to their efficiency, and it is desired to gradually increase the number of bicycles used where it can be done to advantage. The appropriation should also include the purchase of revolvers. At present the members of the force have to provide revolvers from their personal funds. Members of the Metropolitan police force are furnished with revolvers from public funds, and it is thought that the park police should be supplied in a similar manner.

6. The wording of the item for the care and improvement of Monument grounds annex has been modified to permit of the erection

of boathouses along the banks of the tidal reservoir and the Potomac River fronting Potomac Park. This portion of the river front is admirably suited for the erection of pleasure boathouses, and it is believed it would be desirable to permit it to be utilized for that purpose.

7. The public playgrounds committee have desired to erect at their own expense temporary wooden structures for shelter, etc., on some of the public reservations that have been set aside as public playgrounds, but under existing law they could not be permitted to do so. These shelters would add largely to the comfort and pleasure of the children, and in the item "For improvement, care, and maintenance of various reservations" I have incorporated a proviso authorizing their erection.

8. I have requested the sum of $2,000 for curbing, coping, and flagging for park roads and walks, instead of the $1,000 granted for 1908. Up to and including 1907 $2,000 was the sum annually granted for this class of work, but as only half that amount was needed for 1908 I reduced my estimate for that year. The additional amount will be required for 1909, and its appropriation is recommended.

9. The sum of $3,000 is asked for establishing and caring for and maintaining children's playgrounds on public reservations. By existing legislation the officer in charge of public buildings and grounds is authorized to grant the use of the public grounds for children's playgrounds, but it is respectfully submitted that permission to use the grounds for that purpose is not sufficient. An appropriation should be made for fitting them up, and every year the necessary appropriations should be made for their care, extension, and renewals as apparatus is worn out and broken. It is believed that there is no other way in which a small amount of money can be expended which would do more good or give greater pleasure or result in more lasting benefit than money appropriated and expended for fitting up, caring for, and maintaining children's playgrounds.

10. I have submitted an item of $3,000 for the care and maintenance of the part of Potomac Park extending along the river side between the inlet to the tidal reservoir and the foot of Twenty-sixth street NW. In sundry civil act of 1908 Congress appropriated the sum of $80,000 for constructing a roadway along this river side and improving the ground on either side thereof. These improvements will be completed by June 30, 1908, and thereafter funds should be annually provided to care for them.

11. I have asked for the sum of $3,500 to repair the approaches and walks in Judiciary Park abutting the court-house building. The present brick pavements are old, in bad order, and unsightly, and should be replaced with cement pavements. This is especially needed because the District government has recently laid cement pavements on the public sidewalks around Judiciary Park, and this Office has just completed the laying of a cement coping around the park.

12. The next step in the improvement of Potomac Park is the construction of a park roadway along its northern boundary on the line of B street, and I have requested an appropriation of $140,000 for that purpose.

13. The plan for the improvement of Potomac Park contemplates making a connection across the inlet into the tidal reservoir between

the detached driveways along the river side of the park, and I have requested the sum of $25,000 to widen the foundations and superstructure of the tidal gates at the inlet in order that the river side drive may be carried across them. The construction of these tidal gates was authorized in river and harbor act approved March 2, 1907.

14. The road surrounding the Monument is a gravel road. The hill on which the Monument stands is a very windy spot, and during dry and windy weather the air around the Monument is filled with flying sand and gravel, which is painful and annoying to all within. This annoyance can be remedied by paving the roadway with asphalt, and an appropriation of $7,500 for the purpose is recommended.

15. The regulations for the Washington Monument provide among other things that there shall be no peddling there. Efforts have been made from time to time by persons interested in charitable objects to have exceptions made to this rule, so that articles could be sold to aid those objects. It is believed that to permit this to be done would detract from the dignity of the edifice reared to perpetuate the memory of Washington, and I therefore recommend that it be prohibited by legislative action. To that end I have incorporated a provision for that purpose in the item for fuel and miscellaneous supplies for the Washington Monument.

16. An estimate of $7,000 for the repair of the United States wharf at Wakefield, Va., the birthplace of Washington, is submitted and recommended.

The wharf is an iron-pile wharf, with timber deck, and was badly damaged by a severe storm and ice jam in February, 1897. An estimate for its repair was submitted last year. In the present estimate the amount is increased by $3,000, as additional damage was caused to the wharf by ice in February, 1905, as mentioned elsewhere in this report. In its present condition it is useless for the purpose for which it was built, viz, as a landing for steamers carrying visitors to the monument at the birthplace.

17. By direction of the War Department an estimate for rebuilding the sea wall along that part of the Potomac River front under the charge of this Office, viz, between the arsenal wall and the southern curb line of N street south, is submitted. The entire length of the front is 1,350 feet, and it is estimated that to rebuild the wall of roughly squared stone laid in Portland cement mortar will cost approximately $30 per linear foot of wall 12 feet high, or say $40,000. The Naval Reserve of the District of Columbia and the Light-House Board each occupy a part of this front, and in case it should be desired to rebuild the wall only in front of the reservations occupied by those Government departments a separate estimate is made for each reservation, except that the estimate for the length of wall along the light-house reservation (93 feet) includes also the front from the south side of that reservation to the arsenal wall (265 feet), a total length of 358 feet.

Financial statement for fiscal year ending June 30, 1907.

Title of appropriation.	Available at beginning of fiscal year.	Appropriated since.	Expended during fiscal year.	Pledged by contract.	Unexpended balance to revert to Treasury.
Improvement and care of public grounds, District of Columbia, 1907	$153,050.00		$147,069.53		$5,980.47
Improvement and care of public grounds, 1907	15,400.00		13,484.32		1,915.68
Repairs, fuel, etc., Executive Mansion, 1907	53,000.00		51,392.53		1,607.47
Extraordinary repairs Executive Mansion, 1907	35,000.00		30,472.98	$4,502.75	24.27
Lighting, etc., Executive Mansion, etc., 1907	20,520.00		18,560.46		1,959.54
Lighting public grounds, District of Columbia, 1907	6,800.00		5,329.76		1,470.24
Telegraph to connect the Capitol with the Departments and the Government Printing Office, 1907	1,500.00		1,374.97		125.03
Contingent expenses public buildings and grounds, 1907	700.00		700.00		
Salaries of employees public buildings and grounds, 1907	70,150.00		68,937.56		1,212.44
Care and maintenance of the Washington Monument, 1907	11,520.00		11,511.58		8.42
Repair of building where Abraham Lincoln died, 1907	200.00		117.92		82.08
Improvement and care of public grounds, District of Columbia, 1907-8		[a] $15,000.00	12,284.64		
Equestrian statue of Gen. William T. Sherman	517.66				
Pedestal for statue of Gen. Philip H. Sheridan	50,000.00		19.83		
Pedestal for statue of Gen. George B. McClellan	19,000.00		19,000.00		
Memorial to Gen. Ulysses S. Grant	82,350.00		2,250.00	80,100.00	
Statue of Brigadier-General Count Pulaski	47,965.12		450.34		
Statue of General Baron von Steuben	48,308.24		3,030.48	42,000.00	
Monument to Gen. Hugh Mercer, Fredericksburg, Va	953.03		12.00		
Unveiling statue of Gen. George B. McClellan	2,500.00		2,391.78		108.22
Statue of Thomas Jefferson	[b] 5,000.00				
Statue of John Paul Jones	50,000.00				
Statue of Commodore John Barry	50,000.00				
Pedestal for statue of Henry Wadsworth Longfellow	4,000.00				
Memorial to Christopher Columbus		[c] 100,000.00			

[a] Sundry civil act March 4, 1907.
[b] For procuring plans for a statue.
[c] Act of March 4, 1907 (Public—No. 267).

I desire to express my appreciation of the faithful services rendered during the past year by the entire force under this Office.

I am, General, very respectfully, your obedient servant,

CHAS. S. BROMWELL.
Colonel, U S. Army, Major, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

Improvement and care of public grounds, etc.—Continued.		
For improvement, care, and maintenance of Smithsonian grounds	$3,000	
For improvement, care, and maintenance of Judiciary Park	2,500	
For laying cement and other walks in various reservations	2,000	
For broken-stone road covering for parks	3,500	
For curbing, coping, and flagging for park roads and walks	2,000	
For establishing, fitting up, and maintaining children's playgrounds	3,000	
For care and maintenance of that part of Potomac Park between the causeway of the Pennsylvania Railroad bridge, the Potomac River, and the tidal reservoir	4,000	
For care and maintenance of that part of Potomac Park along the north and west sides of the tidal reservoir	4,000	
For care and maintenance of that part of Potomac Park extending along the river side between the inlet to the tidal reservoir and the foot of Twenty-sixth street NW	3,000	
For necessary repairs of the approaches and walks in Judiciary Park, abutting the court-house building	3,500	
For continuing improvement of Potomac Park: To continue north B street from Virginia avenue westward to the Potomac River as a park roadway along the northern boundary of Potomac Park according to plans prepared in the Office of Public Buildings and Grounds, to be expended under the direction of the officer in charge of that office, and the jurisdiction over that portion of B street west of Virginia avenue now under the control of the Commissioners of the District of Columbia is hereby transferred to the Chief of Engineers, United States Army	140,000	
For the additional expense of widening the foundations and superstructure of the tidal gates over the inlet to the tidal reservoir in Potomac Park to permit the construction of a roadway over it, to be expended under the direction of the Chief of Engineers, United States Army	25,000	
For paving with asphalt the roadway around the Washington Monument	7,500	
		$267,550
Improvement and care of public grounds:		
For improvement, care, and maintenance of grounds of Executive Departments	1,000	
For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Library of Congress as may be requested by the superintendent of the Library building	1,000	
For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Capitol as may be requested by the Superintendent of the Capitol building	3,000	
For improvement and maintenance of Executive Mansion grounds (within iron fence)	4,000	
For the employment of an engineer by the officer in charge of public buildings and grounds	2,400	
For purchase and repair of machinery and tools for shops at nursery, and for the repair of shops and storehouse	1,000	
		12,400
Repairs, fuel, etc., Executive Mansion:		
For ordinary care, repair, and refurnishing of the Executive Mansion, and for the purchase, maintenance, and driving of horses and vehicles for official purposes, to be expended by contract or otherwise, as the President may determine	35,000	
For fuel for the Executive Mansion, greenhouses, and stable	6,000	
For care and maintenance of greenhouses	9,000	
For repairs to greenhouses	3,000	
		53,000

Lighting, etc., Executive Mansion, etc.:		
For gas, pay of limplighters, gas fitters, and laborers, purchase, erection, and repair of lamps and lamp-posts; purchase of matches and repairs of all kinds; stoves, fuel, and lights for office and office stable, watchmen's lodges, and for the greenhouses at the nursery: *Provided*, That foreach 5-foot burner not connected with a meter in the lamps on the public grounds not more than $18 shall be paid per lamp for gas, including lighting, cleaning, and keeping the lamps in repair under any expenditure provided for in this act, and said lamps shall burn every night on the average from fifteen minutes after sunset to forty-five minutes before sunrise, and authority is hereby given to substitute other illuminating material for the same or less price and to use so much of the sum hereby appropriated as may be necessary for that purpose: *Provided further*, That $4,200 of the foregoing sum shall be paid from the revenues of the District of Columbia and the remainder from the Treasury of the United States: *And provided further*, That not more than $6,000 of said appropriation may be expended for lighting, extinguishing, cleaning, repairing, and painting park lamps of a higher candlepower than those provided for above and not less than 60 candlepower, which lamps shall cost not to exceed $20.85 per lamp per annum, and shall otherwise be subject to the restrictions of this paragraph	$19,500	
For lighting 6 arc electric lights in the Executive Mansion grounds within the iron fence, at not exceeding $85 per light per annum, which sum shall cover the entire cost to the United States of lighting and maintaining in good order each of said lights	510	
For lighting 6 arc electric lights at the propagating gardens at not exceeding $85 per light per annum, which sum shall cover the entire cost to the United States of lighting and maintaining in good order each of said lights	510	
		$20,520
Lighting public grounds, District of Columbia:		
For lighting, arc electric lights in the public grounds, as follows: For 7 in the grounds south of the Executive Mansion; 32 in Lafayette, Franklin, Judiciary, and Lincoln parks; 14 in grounds south of the Executive Mansion and in Monument Park, and 27 in Potomac Park driveway, at not exceeding $85 per light per annum, which sum shall cover the entire cost to the United States of lighting and maintaining in good order each of said lights, in all		6,800
Telegraph to connect the Capitol with the Departments and Government Printing Office:		
For care and repair of existing lines		1,500
		361,770
Care and maintenance of Washington Monument:		
For the care and maintenance of the Washington Monument, namely:		
1 custodian, at $100 per month	$1,200	
1 steam engineer, at $80 per month	960	
1 assistant steam engineer, at $70 per month	840	
1 fireman, at $55 per month	660	
1 assistant fireman, at $55 per month	660	
1 conductor of elevator car, at $75 per month	900	
1 attendant on floor, at $60 per month	720	
1 attendant on top floor, at $60 per month	720	
3 night and day watchmen, at $60 per month	2,160	
		8,820

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
THIRD FLOOR—continued.					
Attic—Continued.					
Chair, side, ebonized, upholstered					
Bookcase, pine					
Clock, black marble					
Basket, waste, wooden					
Toilet set, 5 pieces, odd					
Foot rests, mahogany, upholstered in leather.					
Tray, silver-plated					
Pillows, sofa, covered with satin damask					
Chairs, mahogany, seats upholstered in leather.					
Covers, loose canton flannel					
Chairs, band					
Chairs, gilt					
Dresser, golden oak					
Cushions, felt for gilt chairs					
Rugs, made from carpet					
Chairs, bent wood, gilded					
Covers, loose, for gilded chairs					
Shades, window					
Toilet set, china, 8 pieces					
Towel rack					
Refrigerator, nursery	1	Oct. 30, 1906		$2.50	Dulin & Martin Co.
Cabinets, ebonized					
Stands, flower, wood, ebonized					
Rugs, made from carpet					
Rocker, mahogany, high back					
Extinguishers, fire, nickel plated	2	July 31, 1906	$13.00	26.00	A. C. Rowe & Son, New York.
Buckets, fire, galvanized	2	July 30, 1906	.45	.90	Rudolph & West Co.
Hooks, fire, 6 foot	2	July 19, 1906	5.00	10.00	Kane & Casper
Matting, white ... yards	265	Sept. 15, 1906	.60	159.00	W. B. Moses & Sons.
Chairs, golden oak, wooden seats, for use of band.	36	Mar. 25, 1907		25.17	Clark, Davenport & Co.
Beds, maple, double					
Attic bathroom.					
Stand, towel					
Linen room, attic.					
Mats, bath					
Shams, linen ... pair					
Do ... pairs					
Spreads, bed					
Do					
Sheets, linen ... pairs					
Do ... do					
Towels, linen					
Do					
Towels, pot					
SECOND FLOOR.					
Northwest bed or dressing room.					
Shades, window, green, Holland					
Carpet, Wilton ... yards					
Seat, window, upholstered in blue					
Commode, mahogany					
Chair, rocking, with cushion, mahogany					
Chair, mahogany, side					
Desk, mahogany					
Bureau, mahogany					
Chiffonier, mahogany					
Table, mahogany, invalid's					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	4	....	4	....	.....	.....	....do...	4	Do.
....	.....	10	....	10	....	.....	.....	....do...	10	Do.
....	.....	250	....	250	....	.....	.....	....do...	250	Do.
....	.....	60	....	60	....	.....	.....	....do...	60	Do.
....	.....	150	....	150	....	.....	.....	....do...	150	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	100	....	100	....	.....	.....	....do...	100	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	150	....	150	....	.....	.....	....do...	150	Do.
....	.....	150	....	150	....	.....	.....	....do...	150	Do.
....	.....	16	....	16	....	.....	.....	....do...	16	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
42	Nov. 16, 1906	1	1	2	....	.....	.....	....do...	2	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	.....	1	Do.
....	.....	2	....	2	....	.....	.....	.....	2	Do.
....	.....	1	....	1	....	.....	.....	.....	1	Do.
48	Aug. 31, 1906	....	2	2	....	.....	.....	June 30	2	Do.
19	Sept. 19, 1906	....	2	2	....	.....	.....	....do...	2	Do.
43	Sept. 21, 1906	....	2	2	....	.....	.....	....do...	2	Do.
69	Oct. 25, 1906	200	265	465	....	.....	.....	....do...	465	Do.
16	June 7, 1907	....	36	36	....	.....	.....	....do...	36	Do.
....	.....	2	....	2	2	Transferred to West Terrace servants'rooms.	.....	....do...	0	Do.
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	5	....	5	....	.....	.....	June 30	5	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	12	....	12	....	.....	.....	....do...	12	Do.
....	.....	6	....	6	....	.....	.....	....do...	6	Do.
....	.....	7	....	7	....	.....	.....	....do...	7	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	72	....	72	....	.....	.....	....do...	72	Do.
....	.....	12	....	12	....	.....	.....	....do...	12	Do.
....	.....	48	....	48	....	.....	.....	....do...	48	Do.
....	.....	6	....	6	1	Not found.....	.....	June 30	5	Good.
....	.....	74	....	74	....	.....	.....	....do...	74	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
SECOND FLOOR—continued.					
Northwest bed or dress ng room—Cont'd.					
Chair, arm, upholstered in blue					
Fireboard, brass					
Laces, muslin.....pairs					
Mirror, mahogany, small					
Chair, side, walnut					
Foot tub, tin					
Footstool, wicker, painted white					
Mug, toothbrush					
Curtains, cretonne.....pairs					
Northwest bathroom.					
Seat, bath					
Carpet, Wilton, velvet.....yards					
Curtains, window, white, Holland	2	Sept. 15, 1906		$2.21	W. B. Moses & Sons
Northwest bedroom.					
Shades, window, green, Holland					
Desk, mahogany					
Bedsteads, brass					
Springs, woven wire					
Mattresses, hair, 2 pieces each					
Couch, upholstered in blue					
Chair, corner					
Seat, window					
Cushions, for rockers					
Hassocks					
Screen, 3-fold satin damask					
Wardrobe, walnut					
Wardrobe, mahogany					
Chairs, rocking, painted white					
Chair, rocking, mahogany					
Table, mahogany					
Stands, mahogany					
Table, painted					
Chiffonier, mahogany					
Dresser, rosewood					
Chairs, side, mahogany					
Fender, brass					
Fender, wire, spark					
Fire tools, brass, complete.....set					
Andirons, brass					
Fireboard, brass					
Clock, black marble					
Laces.....pairs					
Basket, wooden, waste-paper					
Pillows, sofa, blue satin damask					
Bookcase, mahogany					
Quilt, bed					
Curtains, sash.....pair					
Awnings, window					
Screen, 3-fold, mahogany					
Rug, carpet, Wilton, solid green.yards					
Screen					
Chair, arm, upholstered in blue					
Curtains, for windows, old material interlined with old flannel, lined with new satinet, trimmed with fringe, gimp cord, tassel loops and center tassels, new rods and fixtures, pairs.					
Slip covers, chintz					
Chair, rocking					
Lamp, electric	1	Nov. 23, 1906		4.10	National Electrical Supply Co.
Curtains, window, muslin.....pairs	4	Mar. 28, 1907		28.83	W. B. Moses & Sons

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1	1	Not found		do		
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				June 30	1	Good.
		4½		4½				do	4½	Do.
69	Oct. 25, 1906		2	2				do	2	Do.
		4		4				June 30	4	Good.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		96⅔		96⅔				do	96⅔	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		5		5				do	5	Do.
		1		1				do	1	Do.
46	Dec. 26, 1906		1	1				do	1	Do.
37	Apr. 24, 1907		4	4				do	4	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
SECOND FLOOR—continued.					
Bedroom, west of alcove hall, north side.					
Cabinet, china					
Carpet, blue, Brussels.....yards					
Laces, renaissance.....pair					
Curtains, heavy blue satin damask.pairs					
Bedsteads, iron and brass					
Springs for above					
Mattresses, hair					
Pillows, feather					
Bureau, painted white					
Do					
Washstand, painted white					
Wardrobe, rosewood, painted white					
Table, rosewood, marble top, painted white.					
Chiffonier, walnut, painted white					
Desk, walnut, painted white					
Table, lacquered, painted white					
Couch, upholstered in blue damask					
Chair, Turkish, upholstered in blue damask.					
Chair, arm, upholstered in blue damask					
Chairs, side, upholstered in blue damask					
Seat, window, upholstered in blue damask.					
Pillows, sofa, upholstered in blue damask.					
Quilt, silk					
Basket, wooden, waste paper					
Candlesticks, china					
Vases, china, decorated in blue					
Vase, flower, dark green					
Toilet set, Japanese, 6 pieces					
Clock, brass, and glass					
Match safe, Wedgwood, blue					
Mirror, gold frame					
Andirons, brass.....pair					
Fender, brass					
Fire tools, complete.....set					
Vase, flower, glass					
Chair, rocking, cherry					
Hassock					
Lamp					
Shade, silk					
Table, walnut, painted white, marble top.					
Quilts, bed	1	Nov. 28, 1906		$7.50	W. B. Moses & Sons
Screen					
Screen, Japanese					
Hamper, clothes					
Wardrobe, rosewood, plate-glass door (mirror).					
Shade, window, green					
Curtains, cretonne.....pair					
Hamper					
Awning					
Towel rack					
Dresser, rosewood, painted white					
Alcove hall.					
Curtains, Brussels lace.....pair					
Bedroom, east of alcove hall, north side.					
Shade, window, green					
Table					
Carpet, Brussels.....yards					
Laces, Brussels.....pair					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		77½		77½				do	77½	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
76	Dec. 29, 1906	2	1	3	2	Burned; worthless	The President	do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1	1	Not found		do	0	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				June 30	1	Good.
		2		2	1	Not found		June 30	1	Good.
		1		1				do	1	Do.
		74⅔		74⅔				do	74⅔	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
SECOND FLOOR—continued.					
Bedroom, east of alcove hall, north side—Continued.					
Beds, brass, 3 feet 6 inches wide					
Springs					
Mattresses, hair					
Pillows, feather					
Quilts, silk					
Bureau					
Chair, Turkish, upholstered					
Chair, side, upholstered					
Couch					
Clock, black marble					
Vases, bronze					
Vases, bronze, small					
Fire tools, brass, complete.....set					
Basket, iron, grate					
Bottles, cut-glass					
Basket, wooden, waste					
Seat, window, uphostered in pink satin damask.					
Pillow, sofa, covered with satin damask					
Statuettes					
Picture, Christ in the Temple					
Picture, Madonna					
Picture, Madonna at organ					
Chair, maple, rocking, with cushion					
Slip covers					
Rug, carpet, Wilton, red, white figure, yards.					
Wardrobe, mahogany					
Table, maple					
Curtains, cretonne.....pair					
Chair, rocking					
Large northeast bedroom.					
Curtains, window, muslin	2	Sept. 15, 1906		$2.21	W. B. Moses & Sons
Covers, table, plush					
Splasher, washstand					
Shades, window, green					
Rocker, white					
Bedstead, mahogany, canopy draped					
Table, mahogany, toilet					
Mirror, mahogany, gilt					
Mirror, mahogany, cheval glass					
Wardrobe, mahogany					
Table, mahogany, writing					
Table, mahogany, night					
Table, mahogany, round					
Bureau, mahogany, chest of drawers					
Washstand, mahogany					
Carpet					
Curtains, white-ground material, lined, pairs.					
Awning					
Baskets, waste					
Cover, bed, pique					
Small northeast bedroom.					
Curtains, window, muslin					
Shades, window, green					
Bedstead, 4-0 brass					
Bed spring, upholstered					
Mattress					
Bureau, painted					
Table, writing, painted					
Table, night, painted					
Chairs, painted, light					
Carpet					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		2		2				June 30	2	Good.
		2		2				do	2	Do.
		4		4				do	4	Do.
		4		4				do	4	Do.
		3		3	1	Worn out		do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				dg	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		10		10				do	10	Do.
		115		115				do	115	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
69	Oct. 25, 1906	2	2	4				June 30	4	Good.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				June 30	2	Good.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
SECOND FLOOR—continued.					
Small northeast bedroom—Continued.					
Curtains, cretonne.....pairs..					
Awnings					
Rocker					
Cover, bed, pique					
Small southeast bedroom.					
Curtains, window, muslin	2	Sept. 15, 1906		$2.21	W. B. Moses & Sons.
Shades, window, green					
Comfort, down					
Bed, 4-0 brass					
Bed spring, upholstered					
Mattress, hair					
Bureau, painted green and white					
Table, writing, painted green and white					
Table, night, painted green and white					
Chairs, painted green and white, in cotton.					
Carpet					
Curtains, rose armure.....pairs..					
Basket, scrap					
Scarfs, bureau					
Large southeast bedroom.					
Curtains, window, muslin					
Covers, table, plush					
Splasher, washstand					
Shades, window					
Comfort, down					
Couch, upholstered in blue					
Chair, rocker, white					
Bedstead, mahogany, canopy					
Bed spring, upholstered					
Mattress					
Table, mahogany, toilet					
Mirror, gilt, toilet, colonial					
Mirror, mahogany, cheval glass					
Wardrobe, mahogany					
Table, mahogany, writing					
Table, mahogany, night					
Table, mahogany, round					
Bureau, mahogany, chest of drawers					
Sofa, in cotton					
Washstand, mahogany					
Carpet					
Curtains, white-ground material, lined, complete, pairs.					
Hamper, clothes					
Chair, rocker, mahogany finish					
Basket, scrap					
Bureau scarfs.....sets..					
Baskets, waste					
Library, south side.					
Silk, china.....yards..					
Cover, desk					
Mat, lamp					
Curtains, heavy satin damask....pairs..					
Bookcases, walnut, small					
Bookcase, revolving					
Table, rosewood, inlaid and carved					
Sofas, upholstered, wool tapestry					
Lounge, unholstered, wool tapestry					
Chairs, Turkish, wool tapestry					
Chairs, side, wool tapestry					
Chair, arm, straight back					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		2		2				June 30	2	Good.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
69	Oct. 25, 1906	2	2	4				June 30	4	Good.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				June 30	2	Good.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		19½		19½				June 30	19½	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
SECOND FLOOR—continued.					
Library, south side—Continued.					
Chair, arm, rosewood, upholstered					
Chair, arm, overstuffed					
Medallion, in frame					
Piano, Bradbury grand					
Bronze bust, George Washington					
Vases, bronze					
Figures, bronze women					
Clock, black marble with bronze top					
Candelabrum, brass, 3 lights					
Vase, china, decorated in blue and gold					
Stool, piano, revolving					
Fire tools, brass, complete.....set					
Andirons, brass, complete.....pair					
Cuspidors, brass					
Piano cover, green plush					
Mat, table, green plush					
Painting, oil, John Hampden					
Water color, statue, Daniel Webster					
Lamp					
Shade, lamp, umbrella					
Water color, marine scene					
Water color, marine scene					
Pillows, plush					
Pole, curtain, brass, with rings and brackets.					
Table, tea, mahogany					
Screen					
Lamp					
Globe, lamp					
Tables, side, high, marble-top					
Chairs, mahogany, solid-wood backs					
Covers, loose, cotton damask					
Rug, Scotch woven, oval shape					
Kidney desk, mahogany					
Shade, lamp					
Shade					
Lamp					
Curtains, renaissance lace.....pairs					
Table, tea, mahogany					
Room west of library.					
Bedstead, youth's single					
Chairs, arm, upholstered in satin					
Chairs, arm, upholstered in damask					
Couch, upholstered in satin damask					
Chair, rocker, cherry, with cushion					
Screen, 3-fold, cherry, stained					
Desk, mahogany					
Bureau, rosewood					
Dresser, rosewood					
Wardrobe, walnut					
Washstand, walnut					
Andirons, brass.....pair					
Fire tools, brass, complete.....set					
Fender, brass					
Basket, wooden, waste paper					
Candlesticks, brass and glass.....pair					
Statuettes, fisherman and fisherwoman, pair.					
Clock, brass and glass					
Vases, flower, Japanese					
Vases, white and gold; scenes from the desert.					
Vases, red and gold					
Match safe, brass					
Stand, ebony					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
SECOND FLOOR—continued					
Room west of library—Continued.					
Shade, lamp, red, umbrella					
Slip covers					
Chair, rocking, mahogany, high back					
Chair, rocking, mahogany, low					
Cushion					
Mattress, hair					
Cabinet, china					
Shades, window, green					
Curtains, heavy, red satin damask					
Shades, white, Holland					
Quilt, down	1	Oct. 28, 1906		$7.50	W. B. Moses & Sons
Southwest bedroom.					
Mattress, hair					
Bolster					
Curtains, heavy light-green satin damask, pairs.					
Laces, renaissance ... pairs					
Beds, brass, ¾					
Mattress, hair					
Pillows, feather					
Springs					
Glass, pier, mahogany					
Washstand, walnut, marble top, high back.					
Wardrobe, mahogany					
Dresser, walnut, marble top					
Dresser, mahogany, marble top					
Lounge, upholstered					
Chairs, arm, upholstered					
Chair, arm, upholstered, high back					
Chairs, side, upholstered					
Seats, window					
Pillows, sofa					
Table, walnut, marble top					
Table, round, mahogany					
Toilet set, 7 pieces					
Fender, brass					
Andirons, brass					
Fire set, brass, complete					
Basket, brass, waste					
Clock, black marble					
Ornaments, black marble, to accompany clock.					
Vases, flower					
Photograph, President Arthur, in gilt frame.					
Engravings, in gilt frames					
Table, lacquered					
Vases, flower, cut glass					
Vase, flower					
Mirror, brass, oval, easel back					
Lamp					
Carpet, Wilton, velvet ... yards					
Covers, bureau					
Cover, dressing case					
Cover, side table					
Cover, table, plush					
Shams, pillow					
Quilt, bed					
Bed, brass					
Spring, box					
Pillow, hair					
Pad, desk					
Rack, pen					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
....	.....	1	....	1	1	Worn out	.....	June 30	0	Good.
....	.....	10	....	10	....	.....	.....	....do...	10	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
76	Dec. 29, 1906.	....	1	1	1	Burned; worthless	.....	....do...	.....	Do.
....	.....	1	....	1	....	.....	.....	June 30	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	4	....	4	....	.....	.....	....do...	4	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Old.
....	.....	2	....	2	....	.....	.....	....do...	2	Good.
....	.....	5	....	5	....	.....	.....	....do...	5	Do.
....	.....	4	....	4	3	Burned; worthless.	The President	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	8	....	8	....	.....	.....	....do...	8	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	121	....	121	....	.....	.....	....do...	121	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
SECOND FLOOR—continued.					
Southwest bedroom—Continued.					
Inkstand					
Screen					
Basket, waste					
Scarf, bureau					
Supporters, book.....pairs					
Blankets, Roman					
Awnings, window					
Covers, loose					
Basket, waste, wooden					
Curtains, window, French swiss .pairs					
Curtains, bed (for making).....do					
Fender, brass					
Fire tools, brass, complete.....set					
Bed, double, rosewood, carved					
Mattresses, hair					
Bolsters, feather					
Canopy, gilt, over bed					
Silk, blue moire.....yards					
Lining, sateen.....do					
Carpet, velvet, for rug.....do					
Carpet, border, velvet, for rug....do					
Damask, silk.....do					
Damask, silk.....do					
Interlining, for draperies, etc.....do					
Sofa, in cotton					
Curtains, for windows, cream ground silk, lined with satinet, interlined with flannel, front and bottom ornamented with gimp, cord loops, with slides, center tassel, pairs.					
Covers, mattress pique					
Slip covers, chintz					
Blankets.....pair					
Curtains, window, muslin, white fringe, pairs.	2	Sept. 15, 1906		$18.00	W. B. Moses & Sons
Drapery, bed	1	.....do		5.85	.....do
Rug, green, Wilton carpet					
Southwest dressing room.					
Rug, Wilton, green					
Sofa, upholstered					
Chair, arm, upholstered					
Chair, side, upholstered					
Seat, window, upholstered					
Pillows, sofa					
Bureau, rosewood					
Desk, writing, inlaid					
Basket, wooden, waste paper					
Fender, fire, brass					
Fire tools, brass, complete.....set					
Basket, grate, iron					
Sideboard top, oak					
Figure, bronze, storks					
Figure, bronze, pheasants					
Vases, flower					
Candlesticks, brass					
Statuette, bisque					
Match safe, brass					
Bed, folding, walnut					
Mattresses, hair					
Pillows, feather					
Dish, soap, silver plated					
Chair, walnut, cane					
Laces, renaissance					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		3		3				do	3	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		12		12				do	12	Do.
		50		50				do	50	Do.
		58		58				do	58	Do.
		34		34				do	34	Do.
		66½		66½				do	66½	Do.
		10⅝		10⅝				do	10⅝	Do.
		100		100				do	100	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.
69	Oct. 25, 1906		2	2				do	2	Do.
69	do		1	1				do	1	Do.
			1	1	1	Transferred to storehouse, propagating gardens.		do	0	
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		5		5				do	5	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1	1	Sold at auction	The President	do	0	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
SECOND FLOOR—continued.					
Southwest dressing room—Continued.					
Screen, 4-fold, black					
Awnings, window					
Rugs, oriental					
Chiffonier, walnut					
Stand, shaving, mahogany					
Rack, towel, walnut					
Chairs, side, walnut, cane seat					
Wardrobe, walnut					
Hamper, clothes					
Shade, white, Holland					
Shades, green					
Curtains, window, French Swiss..pairs					
Bottles, cut glass					
Curtains, cretonne.....pairs					
Southwest bathroom.					
Curtains, sash.....pairs	1	Sept. 15, 1906		$2.21	W. B. Moses & Sons
Corridor, second floor.					
Cabinets, ebonized					
Cabinets, mahogany					
Stands, mahogany, marble top					
Table, mahogany, long					
Chairs, arm, mahogany, upholstered in leather.					
Chairs, arm, mahogany, upholstered in satin damask.					
Chairs, side, mahogany, upholstered in satin damask.					
Settees, mahogany, upholstered in leather.					
Chairs, side, mahogany, upholstered in leather.					
Screen, ebonized, 6-fold					
Seats, corner, upholstered in satin damask.					
Pillows, sofa, covered with satin damask					
Painting, oil, General Grant					
Engraving, Queen Victoria landing at Portsmouth.					
Bowl, covered, papier-maché					
Jardinieres, brass					
Vases, high, Italian marble					
Figure, bronze, woman with cupid on shoulder.					
Figure, bronze, woman with cupid at feet.					
Figure, bronze					
Jardiniere, bronze, low					
Table, ebony, marble top					
Table, ebony, square top					
Stand, ebony, carved					
Settee, upholstered in green satin damask.					
Chairs, arm, upholstered in green satin damask.					
Seat, window, long					
Cushion for long window seat, satin damask.					
Stand, high, mahogany					
Bookcase, revolving, walnut					
Chair, rocking, low, mahogany					
Chair, rocking, high, mahogany, cane seat.					
Figure, bronze, woman with lyre					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		3		3				do	3	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4	1	Worn-out		do	3	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
69	Oct. 25, 1906	4	1	5				June 30	5	Good.
		2		2				June 30	2	Good.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		18		18				do	18	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
SECOND FLOOR—continued.					
Corridor, second floor—Continued.					
Photograph, framed in oak (cathedral)					
Photograph, framed in oak (Coliseum at Rome).					
Photograph, framed in oak, "Gladiator."					
Vases, Hungarian ware					
Jardiniere, English					
Vase, flower, Dresden, 4 posts					
Table, round, mahogany					
Clock, mahogany					
Portrait, oil, President Millard Fillmore					
Portrait, oil, James A. Garfield					
Chair, rocking, mahogany					
Pillows, down, covered with red velour					
Table, tea, mahogany					
Screen					
Table					
Shade, lamp					
Basket, music					
Lamp, B. and H., with shade					
Rugs, Wilton, with fringe					
Table, small, ebonized					
Table, carved, Flemish oak					
Rugs, made from carpet, "Item 5"					
Cover, loose, cotton damask					
Chairs, arm, upholstered in leather					
Stand, flower, wood, ebonized					
Corridor, second floor, east end.					
Carpet					
Cover, loose, cotton damask					
Chair, side, Flemish oak					
Curtains, window, Pongee silk.....set	1	Sept. 15, 1906		$37.50	W. B. Moses & Sons.
Corridor, second floor, west end.					
Chair, rocker, mahogany finish					
Table, mahogany finish					
Do					
Curtains, window, Pongee silk..set	1	Sept. 15, 1906		37.50	W. B. Moses & Sons.
President's study.					
Rug, Wilton carpet					
Curtains, window, brown velour, poles, cords, etc., pairs.					
Bookcase, oak					
Lamp, electric, desk, 2 lights, dark, fire gilt, and shades.					
Small sewing room, north side.					
Awning					
Large southeast bathroom.					
Curtain, sash					
Large northeast bathroom.					
Curtains, sash					
Landing and stairs.					
Curtain, Brussels lace					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	3	....	3	....	.....	.....	....do...	3	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	4	....	4	....	.....	.....	....do...	4	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	1	Worn-out.....	.....	....do...	0	
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
69	Oct. 25, 1906	....	1	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	1	....	....	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
69	Oct. 25, 1906	....	1	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	1	....	1	....	.....	.....	June 30	1	Old.
....	.....	1	....	1	....	.....	.....	June 30	1	Good.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR.					
Pantry.					
Teapot					
Table, breakfast, walnut					
Table, long, mahogany					
Hamper, clothes, wicker					
Clock, wooden, eight-day					
Kettle, tea, galvanized iron					
Trays, japanned					
Canister, tea, tin, japanned					
Towels, glass ... dozen					
Towels, roller ... do					
Tray, bread					
Knife, carving					
Fork, carving					
Knife, ham					
Refrigerator, nursery					
Steel, knife					
Tray, wood					
Chest, cake					
Boxes, sugar					
Basket for silver					
Coffeepot, small, tin					
Linoleum ... yards					
Teapots					
Plate warmer, electric					
Refrigerator					
Teapots					
Ice crusher					
Mustard holder					
Mats, asbestos					
Beef press					
Squeezer, lemon					
Kettle					
Hose, gas					
Corkscrews					
Paddles, butter ... pair	1				
Ice shaver	1	Oct. 3, 1906		$12.00	Dulin & Martin Co.
Jar, cracker, glass	1	Jan. 25, 1907		1.50	do
Bread box	1	Apr. 25, 1907		2.25	do
Private dining room.					
Curtains, velour, double face ... pairs					
Covers, sideboard					
Goblets, cut glass ... dozen					
Saucers, cut glass, champagne ... do					
Glasses, cut glass, claret ... do					
Glasses, cut glass, cordial ... do					
Glasses, cut glass, punch, handled ... do					
Plates, cut glass ... do					
Cups and saucers, tea ... do					
Tables, side, mahogany					
Cigar box, tin, square					
Fender, glass					
Fire set—tongs, poker, shovel, and stand					
Andirons, brass					
Clock, black marble					
Candelabra, high, bronze and gilt					
Figure, bronze, "Antelope"					
Kettle, tea, brass					
Stand, brass, for kettle					
Vases, majolica					
Jardiniere, blue and white paintings of birds on side.					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Old.
....	.....	1	....	1	....	.....	.....	....do...	1	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	4	....	4	....	.....	.....	....do...	4	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	5	....	5	2	Worn out.....	.....	....do...	3	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	1	Broken; dropped.	.....	....do...	0	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	20¾	....	20¾	....	.....	.....	....do...	20¾	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	24	....	24	....	.....	.....	....do...	24	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
42	Nov. 16, 1906	1	....	1	2	.....	.....	....do...	2	Do.
37	Feb. 19, 1907	....	....	1	1	.....	.....	....do...	1	Do.
40	May 24, 1907	....	....	1	1	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	June 30	2	Good.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1½	....	1½	....	.....	.....	....do...	1½	Do.
....	.....	1½	....	1½	....	.....	.....	....do...	1½	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1½	....	1½	....	.....	.....	....do...	1½	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR—continued.					
Private dining room—Continued.					
Jardiniere, Chinese					
Plate, Chinese					
Vase, yellow and white, with stand, English ware.					
Pitcher, fancy, blue, Hungarian ware					
Dishes, meat, silver-plated					
Plates, ice cream, cut glass.....dozen					
Tablecloths, linen					
Napkins, linen.....dozen					
Doilies, linen.....do					
Tongs, sugar, silver.....pair					
Screens					
Table, pine					
Salt cellars, glass					
Dishes, meat					
Dishes, bonbon					
Knives, fruit					
Cups, egg					
Knives					
Urn, bouillon, silver-plated					
Cloths, drawn work					
Baskets					
Sideboard, mahogany					
Table, mahogany extension					
Table, mahogany console					
Cabinet, mahogany, for china					
Mirror, mahogany and gold, "colonial"					
Chairs, mahogany and leather					
Chairs, mahogany, with arms, leather upholstered.					
Curtains, for windows.....pairs					
Rug, Yaprae, 15′ 5″ by 19′ 9″					
Mirror, French gold					
Table, mahogany, serving					
Folding screen, brass, for fireplace					
Screens, white silk					
Knives, pearl handles					
Pitchers, glass					
Cups and saucers					
Teapots					
Pitchers					
Tea caddy					
Spoons, salt					
Dishes, oatmeal					
Finger bowls, cut glass					
Finger bowls, plate					
Vase, cut glass	1	Dec. 4, 1906		$4.50	Dulin & Martin Co
Ante or ushers' room.					
Water cooler					
Cabinet, key					
Rugs, Turkish					
Shade, white Holland					
Lambrequin, window					
Vases, Holland, delft					
Painting, Rio de Janeiro Boy					
Brush, hair					
Comb					
Shade, Holland					
Desk, Flemish finish					
Rug, Ouchac					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		5		5				do	5	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		6		6				do	6	Do.
		2		2				do	2	Do.
		12		12				do	12	Do.
		12		12				do	12	Do.
		12		12				do	12	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		10		10				do	10	Do.
		2		2				do	2	
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		12		12				do	12	Do.
		8		8				do	8	Do.
		2		2				do	2	Do.
		18		18				do	18	Do.
		2		2	2	Broken; worthless.		do	0	Do.
		12		12				do	12	Do.
		1		1				do	1	Do.
		18		18				do	18	Do.
		24		24				do	24	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
31	Jan. 22, 1907			1	1			do	1	Do.
		2		2				June 30	2	Good.
		1		1				do	1	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR—continued.					
Ante or ushers' room—Continued.					
Curtains, window, red flax velours lined with silk, interlined with flannel, trimmed with fringe, center tassels, cord loops with slides, carved walnut poles, pair.	....	.....	.....	.....	.....
Chair, revolving, mahogany, No. 1072	....	.....	.....	.....	.....
Desk, mahogany, No. 292	....	.....	.....	.....	.....
Chairs, arm, mahogany, No. 482	....	.....	.....	.....	.....
Chair, mahogany, No. 482	....	.....	.....	.....	.....
Table, side, mahogany, No. 1487	....	.....	.....	.....	.....
Stand for water cooler	....	.....	.....	.....	.....
Stand, umbrella	....	.....	.....	.....	.....
Cover, desk, plush	....	.....	.....	.....	.....
Basket, waste	....	.....	.....	.....	.....
Register, tallying	....	.....	.....	.....	.....
Drapery, window	1	Sept. 29, 1903	.....	$145.06	W. B. Moses & Sons
Main vestibule.					
Shades, window, white Holland	....	.....	.....	.....	.....
Trays, card, silver	....	.....	.....	.....	.....
Detector, watchman's	....	.....	.....	.....	.....
Jardinieres, Istrian marble, white	....	.....	.....	.....	.....
Zinc cases for same	....	.....	.....	.....	.....
Lantern, electric, 12-light, antique, gold, glass panels, candelabra lamps.	....	.....	.....	.....	.....
Standards, electric, 10-light, dark fire gilt, lily shades.	....	.....	.....	.....	.....
Curtains, windows each side of north door, red velours lined with silk, interlined with double flannel, trimmed with rich fringe, silk center tassels, silk cord loop with slides, poles, pairs.	....	.....	.....	.....	.....
Frame, gold	....	.....	.....	.....	.....
Portrait, President Roosevelt	....	.....	.....	.....	.....
Cotton damask, for loose covers....lot	....	.....	.....	.....	.....
Portrait, President McKinley	....	.....	.....	.....	.....
Draperies, door	2	Sept. 29, 1906	.....	290.12	W. B. Moses & Sons
Draperies, window	3	....do	.....	435.18	....do
Rug, Wilton	1	Nov. 6, 1906	.....	25.84	....do
Mat, door	1	Jan. 31, 1907	.....	7.50	....do
Covers, slip and loose	2	....do	.....	4.18	....do
East Room.					
Shades, window, white Holland	....	.....	.....	.....	.....
Curtains, heavy satin damask	....	.....	.....	.....	.....
Chairs, side, upholstered in satin damask.	....	.....	.....	.....	.....
Chairs, corner, upholstered in satin damask.	....	.....	.....	.....	.....
Chairs, arm, upholstered in satin damask	....	.....	.....	.....	.....
Covers, loose	13	Dec. 31, 1906	.....	27.50	W. B. Moses & Sons
Painting, President Washington	....	.....	.....	.....	.....
Painting, President Jefferson	....	.....	.....	.....	.....
Painting, President Lincoln	....	.....	.....	.....	.....
Painting, Mrs. Martha Washington	....	.....	.....	.....	.....
Table top, white pine	....	.....	.....	.....	.....
Candelabra on mantels, 9 lights each, with marble bases, real candles, glass bobeches, dark fire gilt, pairs.	....	.....	.....	.....	.....
Standards, electric, 12 lights, dark fire gilt, marble bases, candelabra lamps.	....	.....	.....	.....	.....
Curtains for windows, made of damask, old gold color, lined with silk, interlined with molleton, front and bottom finished with fringe silk, center tassels, silk tassel loops, sets.	7	Sept. 29, 1906	.....	2,809.50	W. B. Moses & Sons

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907. June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	2	Do.
		2		2				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
70	Oct. 25, 1906		1	1				do	1	Do.
		2		2				June 30	2	Good.
		6		6				do	6	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
70	Oct. 25, 1906		2	2				do	2	Do.
70	do		3	3				do	3	Do.
76	Dec. 26, 1906		1	1				do	1	Do.
35	Feb. 19, 1907	4	1	5				do	5	Do.
35	do	4	2	6				do	6	Do.
		6		6				June 30	6	Good.
		9		9				do	9	Do.
		12		12				do	12	Do.
		4		4				do	4	Do.
		8		8				do	8	Do.
32	Jan. 22, 1907	13	13	26				do	26	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		4		4				do	4	Do.
70	Oct. 25, 1906	7	7	14	7	Cut up to cover furniture, etc.	The President	do	7	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR—continued.					
East Room—Continued.					
Cornices, window, carved cherry wood and partly papier-maché, gilded, sets.					
Banquettes, 11 4′ 6″ by 1′ 6″, 2 2′ 9″ by 1′ 6″, richly carved, gilded, and glazed to an old effect, stuffed plain, covered with Bonton d'or colored velours de Genes, finished with gimp, loose colors of yellow figured linen.					
Tables, console, Louis XIV, gilded, marble tops.					
Andirons, Louis XIV, in gilt.....pairs..					
Dogs, iron.....sets..					
Fire tools, iron (poker and shovel to each), sets.					
Stands, gilt, for fire tools.....					
Jardinieres, bisque, ram's-head handles.					
Jardinieres, with raised Cupids and gold goat's-head handles.					
Cotton damask, for loose covers...lot..					
Awnings.....					
Lining, satin, for draperies.....yards..					
Pedestals, marble.....					
Green Room.					
Andirons.....pair..					
Covers, wall, cotton damask.....					
Laces, window, renaissance.....pairs..					
Piano, Knabe, concert grand.....					
Sofa, upholstered, green satin damask..					
Chairs, arm, upholstered, green satin damask all over.					
Chairs, upholstered, green satin damask all over.					
Stool, piano, upholstered.....					
Mirror over mantelpiece, gilded wood, with United States shield over center at top.					
Mirror on console table, gilded wood, with United States shield over center at top.					
Cabinet stand and cabinet combined, about 3 feet high, Japanese or Chinese lacquered and ornamented in gilt.					
Andirons, brass.....					
Fender, brass, low, open.....					
Fire screen, brass and green damask....					
Fire screen, silk embroidered, United States coat of arms behind glass in black frame.					
Stand, music, gilt, wood, presented by Austrian minister.					
Statuette, bronze, Diane de Cabies.....					
Clock, bronze and onyx.....					
Vase, pink crown derby.....					
Vase, yellow crown derby.....					
Vase, decorated in gold, of porcelain Sèvres; no handle; picture of seaport, mountains in background, in foreground a peasant driving cattle, woman in red sitting on bench, child in blue and red standing by woman to the right.					
Oil painting, portrait President Buchanan.					
Oil painting, portrait President Jackson.					
Oil painting, portrait President Van Buren.					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		7		7				June 30	7	Good.
		13		13				do	13	Do.
		4		4				do	4	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		168		168				do	168	Do.
		2		2				do	2	Do.
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		2		2				do	2	Old.
		1		1				do	1	Good.
		1		1				do	1	Do.
		2		2				do	2	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Broken.
		1		1				do	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR—continued.					
Green room—Continued.					
Oil painting, portrait President Arthur					
Oil painting, portrait President Taylor					
Table console, gilded wood, marble top under mirror.					
Laces, Brussels, extra long.....pairs					
Shade, window					
Chairs, antique					
Table, tea, mahogany					
Screen, black, 4-fold					
Cushions, antique					
Lamp, bronze					
Shade, lamp, pink lined					
Covers, loose					
Oil painting, portrait John Quincy Adams.					
Oil painting, portrait Franklin Pierce					
Oil painting, portrait Andrew Johnson					
Oil painting, portrait Wm. Henry Harrison.					
Oil painting, portrait John Adams					
Oil painting, portrait Andrew Jackson					
Curtain poles					
Curtains, for windows; drapery decorations, pairs.					
Sofa, in cotton, painted white					
Pillows, in cotton					
Chairs, arm, in cotton, painted					
Chairs, side, in cotton					
Chairs, light, cane seats					
Chairs, in silk, gilded					
Rug, India					
Screen, brass, folding					
Standards, solid brass, for use at receptions.					
Draperies, window, silk velour					
Blue Room.					
Andirons.....pair					
Cover, wall, cotton damask					
Chair, Ottoman, upholstered in blue damask.					
Ottomans, gilded-wood frames and legs, upholstered in blue damask.					
Covers, furniture					
Covers, wall					
Candelabra, 5 feet, gilded bronze, 12 branches in 2 horizontal planes of 6 each, 1 central branch, tripod bases.					
Clock, mantel, gilded bronze, longitudinal pedestal about 20″ by 8″, sides covered with bas-reliefs of Roman trophies. On the pedestal a seated female figure, probably Goddess of War or Victory; has a Roman helmet on her head and a wreath in left hand. Made by "Thomière et Cie:" also marked at bottom of dial "Momer Aine."					
Candlesticks, mantel, gilded bronze, 2 feet high, probably companions of clock; square pedestals on 4 claw feet; winged female figures on two sides of pedestal, carrying wreath in one hand and trumpet or quill pen in other.					
Vases, dark blue Sèvres, presented by President Faure, of France, to President McKinley.					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Old.
		1		1				do	1	Good.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Old.
		6		6				do	6	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		4		4				do	4	Do.
		6		6				do	6	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		2		2				do	2	Do.
		1		1				June 30	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		30		30				do	30	Do.
		15		15				do	15	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR—continued.					
Blue room—Continued.					
Pillows or cushions in blue satin damask.					
Mirror on gilded wood, console table					
Vases, gilded, porcelain, each on a square base in two steps. Each has two handles, which are swans' necks and heads. One has picture of blind old man carrying youth on left arm, staff in right hand, helmet hanging from belt. The other has picture of blind old man and youth standing on rock overlooking sea; a lyre hangs from old man's back.					
Vase, corrugated white porcelain, overlaid with pond lilies of same. Base is gilded, marked "Moore."					
Hangings, window, curtains, and draperies, blue silk reps, to match walls, curtains, finished front and bottom with embroidery. Draperies with embroidered stars and border lined with silk, interlined with molleton, finished with silk bullion fringe, silk tassel loops, silk center tassels, pairs.	3	Nov. 6, 1906		$1,469.37	Clark, Davenport & Co.
Window poles, richly carved wood, with carved eagles, gilded and glazed.					
Ventilators, Pullman, for windows					
Stanchions, bronze, for roping off space.					
Sofa, richly carved, white and gold, covered with brocade trimmed gimp.					
Chairs, arm, finished as above					
Chairs, single, finished as above					
Chairs, small, finished as above					
Footstools, finished as above					
Cordon, to cut off the room, covered with gold silk velours.					
Screens, white silk					
Shades, white silk					
Screen, brass, folding, for fireplace					
Carpet, Wilton velvet, for use at receptions, yards.					
Red Room.					
Cover, wall, cotton damask					
Screen, fire gilt, gilded wood surmounted by eagle, silk embroidered center, surrounded by 4 cat o' nine tails, showing fireplace in background, man sitting in center before a table carrying the Bible, man kneeling on his right, three females standing behind him, a male and a female servant standing on extreme right of picture.					
Screen, fire, brass, brass frame, damask center.					
Fire tools, steel, brass handles, 4 pieces, set.					
Vases (Faïence) with ebony bases, about 4 feet high. One has painting of "Cupid in Prison," with Roman girl in front of door on one side, on other side a vase on a pedestal, with a fountain and Ionic portico in background. The other has on one side a Roman girl drinking at a tall fountain, 2 doves; on the other side a fluted pillar carrying a fountain bowl containing a dolphin, with a Corinthian portico in background.					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
....	.....	4	....	4	....	.....	.....	June 30	4	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
23	Nov. 14, 1906	3	3	6	3	Transferred to storehouse.	.....	....do...	3	Do.
....	.....	3	....	3	....	.....	.....	....do...	3	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	3	....	3	....	.....	.....	....do...	3	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	4	....	4	....	.....	.....	....do...	4	Do.
....	.....	4	....	4	....	.....	.....	....do...	4	Do.
....	.....	6	....	6	....	.....	.....	....do...	6	Do.
....	.....	4	....	4	....	.....	.....	....do...	4	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	40	....	40	....	.....	.....	....do...	40	Do.
....	.....	15	....	15	....	.....	.....	....do...	15	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	56	....	56	....	.....	.....	....do...	56	Do.
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR—Continued.					
Red room—Continued.					
Stands for above, ebony					
Fender, brass					
Clock, gilt. On top a Roman sword and bowl of rings, at one side is a Roman warrior, etc.					
Vases, gilt, companion pieces to above clock.					
Candelabra, tall, bronze gilt, female figure standing on a globe. Five branches and one center branch; pedestals have bas-relief Roman trophy.					
Jardiniere, green, marked on bottom "F F 207."					
Vases, porcelain, magenta and gold bracket arms. Each has a picture of French revolutionary times.					
Ewer, green and gilt. Ewer has 2 Venus riding a dolphin and looking in a hand glass. 1 Venus riding a dolphin, three Amors. 3 Armors, one with bow and arrow.					
Basin, has (1) Neptune riding the sea; (2) Venus riding a dolphin accompanied by a nymph.					
Bronze group, male figure seated on base of a broken pillar; female figure with face turned away; her right hand in right hand of the man, his left hand on her left shoulder, marked "Morcan."					
Bronze figure, soldier seated, ancient armor, boar's or bear's hand helmet; left elbow resting on a casket on his left knee, marked "Rtion Sauvage."					
Bronze figure, ancient warrior seated bareheaded, battle-ax or scepter across knees.					
Settee, gilded wood, upholstered in red satin damask.					
Chairs, arm, rosewood, upholstered in red satin damask.					
Chairs, side, rosewood, upholstered in red satin damask.					
Chairs, arm, mahogany, upholstered in striped silk.					
Chairs, arm, gilded, wood, upholstered in red satin damask.					
Chairs, side, ditto as above					
Portrait, oil, President Polk					
Portrait, oil, President Tyler					
Portrait, oil, President Hayes					
Portrait, oil, President Harrison					
Portrait, oil, Mrs. Polk					
Portrait, oil, Mrs. Tyler					
Portrait, oil, Mrs. Van Buren					
Portrait, oil, Mrs. Hayes					
Portrait, oil, Mrs. Harrison					
Vase, white and gold, cactus in bloom					
Carpet, Wilton, velvet.....yards					
Chair, antique					
Shade, silk					
Lamp, B and H					
Chair, rocking					
Globe, lamp					
Screen, 4-fold, black					
Pole, curtain, brass with rings					
Portrait, oil, President Zachary Taylor					
Portrait, oil, President James Monroe					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
		2		2				1907. June 30	2	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		20		20				do	20	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR—continued.					
Red room—Continued.					
Portrait, oil, President Thomas Jefferson.					
Portrait, oil, President James Madison					
Engraving, President Washington					
Portrait, President Washington					
Portrait, oil, President Grant					
Poles, curtain					
Rug, Kinnan, 14′ 8″ by 19′					
Curtains, for windows with drapery decorations, pairs.					
Sofas, stuffed all over, red silk					
Chairs, arm, stuffed all over, red silk					
Pillows, feather, covered with red silk, damask, trimmed with fringe, gimp, and rosettes.					
Chairs, stuffed all over, wooden rim, model Henry II, covered with red velours, ornamented with fringe, gimp, and effilé.					
Footstools, pillow-shaped, covered plain with red velours, ornamented with cord.					
Chairs, small, richly carved, white and gold, covered with brocade, trimmed with gimp.					
Andirons, gilt pairs					
Screen, brass					
Scarfs	2	Oct. 31, 1906	$1.50	$3.00	Woodward&Lothrop.
Centerpieces	2	do	1.50	3.00	do
State dining room.					
Shades, white Holland					
Tables, side, walnut					
Table, breakfast, walnut					
Candelabra, gilt, 11 lights					
Stands, gilt, tall					
Holders, cut glass					
Group, bronze, pheasant with young					
Mirrors, gilt					
Plateau, in 7 pieces, gilt mirror frame					
Figures, gilt, women with wreaths					
Ornaments, gilt, used with plateau					
Screens, window					
Table, dining, round, mahogany					
Chairs, arm, oak, carved, velvet cushions					
Chairs, high back, no arms, tapestry covered mahogany.					
Table, mahogany, extension, oblong shape, rounded corners.					
Sideboard, long, mahogany, carved, eagle legs, marble top, brass trimmings.					
Tables, serving, consolé, mahogany, carved eagle supports.					
Curtains, for windows pairs					
Head, stuffed, wild bison					
Head, stuffed, white Alaska sheep					
Head, stuffed, elk					
Head, stuffed, caribou					
Head, stuffed, antelope					
Head, stuffed, mountain sheep					
Head, stuffed, giant Alaska moose					
Head, stuffed, mountain lion					
Head, stuffed, grizzly bear					
Head, stuffed, Kadrap Island bear					
Tapestry, panel (north side)					

Inventory of public property, Executive Mansion, June 30, 1907—**Continued.**

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
62	Nov. 21, 1906	2		2				do	2	Do.
62	do	2		2				do	2	Do.
		5		5				June 30	5	Good.
		4		4				do	4	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		5		5				do	5	Do.
		32		32				do	32	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		16		16				do	16	Do.
		20		20				do	20	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		50		50				do	50	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		5		5				do	5	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR—continued.					
State dining room—Continued.					
Rug, plain green, 24 by 37 feet					
Screen					
Fixtures, fireplace, wrought iron, large					
Firedogs, iron ... pair					
Fire-set, iron					
Screen, metal, folding, finished black					
Holders, ramakin					
Cups, ramakin					
Carpet, Wilton velvet, for use at receptions, yards.					
Covers for mounted heads, cotton damask.					
Goblets ... dozen					
Awning, window					
Main corridor.					
Pedestals, covered in red plush					
Pedestal, marble and plaster					
Bust, marble, President Fillmore					
Bust, marble, Hon. John Bright					
Bust, marble, Judge Hay					
Bust, marble, Unknown					
Bust, marble, Americus					
Jardinieres, majolica ware					
Portrait, oil, Grover Cleveland					
Covers, loose, cotton damask ... lot					
Pedestal, plush covered					
Table, marble top, round					
Table, marble top, mahogany					
Stands, marble, high					
Covers, loose					
Jardinieres, Chinese					
Screen, mahogany, 5-fold					
Screens, mahogany, small					
Chairs, mahogany, arm, upholstered					
Chair, arm					
Urns, brass					
Engraving, President Garfield					
Rugs, plain red, 12′ by 73′					
Standards, electric, 10 lights, dark fire gilt, lily shades.					
Banquettes, richly carved French walnut, stuffed, plain, covered with red silk velours, finished with gimp and large nails; loose covers of red linen.					
Curtains, East Room and State dining-room doors, red velours, lined with silk, interlined with double flannel, trimmed with fringe, rich, silk center tassels, silk cord loops, with slides, poles, pairs.	2	Sept. 29, 1907		$290.12	W. B. Moses & Sons
South portico.					
Rug, carpet, velvet					
Awning, reed					
Awnings, window					
Curtains, drop canvas					
Chair, reclining					
Shade, lawn, with platform					
Awnings, lined with denim					
Awnings, roll, lined with denim					
Awnings, stationary, lined with denim					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		24		24				do	24	Do.
		36		36				do	36	Do.
		29		29				do	29	Do.
		5		5				do	5	3 dozen good, 2 dozen broken.
		1		1				do	1	Good.
		4		4				June 30	4	Good.
		1		1	1	Not found		do	0	
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		10		10				do	10	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		8		8				do	8	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		12		12				do	12	Do.
70	Oct. 25, 1906	2	2	4	2	Transferred to storehouse.		do	2	Do.
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		10		10				do	10	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		5		5				do	5	Do.
		3		3				do	3	Do.
		4		4				do	4	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
FIRST FLOOR—continued.					
South portico—Continued.					
Pillows, sofa					
Awning, with curtain					
North portico.					
Lantern, electric, 18 lights, fire gilt, glass panels.					
Trees, bay ..... pairs					
GROUND FLOOR.					
Steward's room.					
Carpet, Wilton, brown ..... yards					
Matting, white, china ..... do					
Shades, gray holland					
Desk, small, walnut					
Table, walnut, with drawer					
Washstand, walnut					
Table, walnut, small					
Chair, office, revolving					
Chair, oak, cane seat					
Table, oak, extension					
Safe, office, Farrel, Herring & Co.					
Holders, candle, patent, plated					
Boxes for candleholders					
Box, shoe blacking, walnut					
Pillow, leather					
Basket, waste paper					
Chair, low, walnut					
Clock, regulator, 8-day, mahogany					
Clock, cherry, 8-day					
Rugs, camel's hair					
Bobashers, glass					
Shades, paper, red and silver					
Shades, paper, pink and silver					
Shades, paper, yellow and silver					
Shades, silk, red					
Shades, silk, yellow					
Shades, silk, pink					
Cover, piano, blue					
Cover, piano, linen					
Tub, foot, china, toilet					
Toilet set, china ..... pieces					
Plates, fish, Hayes set					
Plates, salad, Hayes set					
Plates, oyster, Hayes set					
Plates, game, Hayes set					
Plates, dinner, Hayes set					
Plates, soup, Hayes set					
Clock, brass, out of order					
Saucers, coffee, Hayes set					
Cups, coffee, Hayes set					
Cups, coffee, after-dinner, Hayes set					
Saucers, coffee, after-dinner, Hayes set					
Plates, dinner, Lincoln set					
Plates, soup, Lincoln set					
Plates, soup, small, Lincoln set					
Plates, breakfast, Lincoln set					
Plates, bread and butter, Lincoln set					
Plates, small, Havilland, odd					
Plates, ice cream, Havilland, pink					
Plates, soup, small, white china					
Plates, tea, white china					
Plates, butter, individual, odd					
Curtains, cretonne ..... pair					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		6		6				June 30	6	Good.
		1	1	1				do	1	Do.
		1		1				June 30	1	Good.
		2		2				do	2	Do.
		88¾		88¾				June 30	88¾	Good.
		88¾		88¾	88¾	Worn out; worthless.		do	0	
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		120		120				do	120	Do.
		10		10				do	10	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		64		64				do	64	Do.
		98		98				do	98	Do.
		100		100				do	100	Do.
		20		20				do	20	Do.
		122		122				do	122	Do.
		128		128				do	128	Do.
		121		121				do	121	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Broken.
		6		6				do	6	Good.
		38		38				do	38	Do.
		34		34				do	34	Do.
		22		22				do	22	Do.
		7		7				do	7	Do.
		24		24				do	24	Do.
		5		5				do	5	Do.
		1		1				do	1	Do.
		23		23				do	23	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		28		28				do	28	Do.
		25		25				do	25	Do.
		14		14				do	14	Do.
		6		6				do	6	Do.
		10		10				do	10	Do.
		2		2				do	2	Do.
		45		45				do	45	Do.
		6		6				do	6	Do.
		6		6				do	6	Do.
		13		13				do	13	Do.
		12		12				do	12	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Steward's room—Continued.					
Pyramid, tin					
Trunks for storing silver					
Buckets, water, galvanized					
Box, walnut, for storing silver					
Trays, walnut					
Trays, serving, wooden					
Funnels, tin					
Washboard					
Bed, walnut, single, folding					
Carriers, tin, hot-water					
Keyboard					
Can, water					
Curtains, lace, Brussels ..... pair					
Refrigerator, oak (cold storage)					
Chairs, horn, upholstered					
Box, tin, for sugar, capacity 50 pounds					
Trays, japanned, large					
Trunks containing silver (6 in all).					
1. Marked "M. le Baron de Tuyll," wooden trunk, covered with leather, bound with iron.					
2. Wooden trunk, covered with leather, iron bound, brass plate marked "No. 2 M. le Baron de Tuyll."					
3. Leather-covered trunk, bound with iron; has brass plate marked "Baron de Tuyll."					
4. Oak trunk, bound with iron; brass plate marked "James Monroe."					
5. Canvas-covered trunk, bound with iron, marked "President's House."					
6. Trunk covered with black leather and bound with iron.					
Tureen, soup, stand, inside and top. Made in France by Christopher. The mark on this silver was first used in 1797. All the silver is marked "President's House."					
Platter, large, fancy border; Platter, medium, fancy border; Plate, fancy border; Plates, thread border — French plate.					
Chocolate pot, thread border; Caster, wine, thread border — Silver					
Casters, salt, for 2 cellars, French plate					
Dishes, vegetable, round, with handles					
Casters, wine, fancy border					
Sifter, sugar, thread pattern					
Spoons, ice cream					
Forks, breakfast, beaded pattern, silver. They were made under Cleveland's second Administration from 84 silver forks and 57 gilt forks that were worn down. These forks were taken to the Treasury Department, weighed, and melted. The silver was then sent to the silversmith's and 96 breakfast and 96 dinner forks made.					
Spoons, tea, thread pattern, silver					
Knives, fruit, pearl handles, with gilt shield in handle. Gilt.					
Spoon, mustard, without handle. Gilt					
Trays, scalloped edge, English plate					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		6		6				do	6	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		2		2				do	2	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1	1	Worn out; worthless.		do	0	
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		5		5	2	Worn out; worthless.		do	3	
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		9		9				do	9	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		95		95				do	95	Do.
		47		47				do	47	Do.
		47		47				do	47	
		1		1				do	1	Do.
		4		4				do	4	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Trunks containing silver (6 in all)—Con.					
Plates, fancy border; made by Christopher. His mark was first used in 1797. French plate.					
Platters, French plate, made by Christopher; thread pattern.					
Mug and stand, sirup, plated, marked "President's House."					
Caster, egg, 6 cups and 6 spoons					
Casters, wine, silver handle, openwork					
Casters, wine, silver					
Caster, wine, plated, will hold 3 decanters					
Skewers, attelètes, 3 eagle and 3 squirrel tops.					
Baking shells, shaped like scalloped shells, plated.					
Cheese scoop, celluloid handle, plated					
Knives, pearl handles, English plated					
Knives, celluloid handles, plated					
Dishes, pudding, with rings					
Serving trays, fancy border, openwork, Gorham plate.					
Pans, crumb, plated, thread border					
Scrapers, crumb, plated, thread border					
Holders, bouquet, leaf pattern, made by Meriden Brittania Co.					
Platters, beaded pattern, Gorham plate.					
Baskets, cake, without handles, English plate.					
Buckets, ice, with handles					
Bell, with black marble					
Spoons, table, thread border, silver					
Forks, dinner, silver, beaded border					
Forks, breakfast, silver, beaded border					
Forks, oyster, silver, plain handle					
Forks, oyster, silver					
Sugar sifter, silver, thread pattern; Christopher.					
Scissors, grape, silver.....pairs					
Forks, salad, beaded pattern, silver					
Spoons, salad, beaded pattern, silver					
Spoons, tea, thread pattern. These were originally gilt French silver.					
Spoons, tea, thread pattern, silver					
Spoons, after dinner, coffee, thread pattern.					
Spoons, berry, fancy border, silver					
Spoons, salad, thread pattern, silver					
Forks, salad, thread pattern, silver					
Rings, napkin, Nos. 1 to 6					
Mustard pots, French silver, made by Christopher.					
Dishes, round, vegetable, with handles, silver.					
Cigar lighter, low, silver					
Cigar lighter, high, buckhorn handle, silver.					
Cruets, pepper, tall, silver					
Forks, asparagus, combination, silver					
Scraper, crumb, thread pattern, silver					
Fork and spoon combined, silver, for salad.					
Knives, butter, thread pattern					
Extinguisher, candle, silver					
Porcupine, silver, for toothpicks					
Spoons, ice cream, fancy pattern handle.					
Ship, silver, "Hiawatha"					
Lake for ship, silver					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
		19		19				1907. June 30	19	Good.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.
		88		88				do	88	Do.
		108		108				do	108	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		6		6				do	6	Do.
		6		6				do	6	Do.
		26		26				do	26	Old.
		6		6				do	6	Good.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		92		92				do	92	Do.
		84		84				do	84	Do.
		72		72				do	72	Do.
		69		69				do	69	Do.
		12		12				do	12	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		4		4				do	4	Do.
		36		36				do	36	Do.
		53		53				do	53	Do.
		83		83				do	83	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		6		6				do	6	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		12		12				do	12	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Trunks containing silver (6 in all)—Con.					
Spoons, dessert, thread pattern, French gilt.					
Spoons, dessert, thread pattern, gilt					
Strainer, tea					
Spoons, mustard, gilt, thread pattern					
Spoon, mustard, gilt, very slender					
Bowls, salad, silver, fancy borders					
Bowls, salad, silver, Gorham, beaded pattern.					
Dishes, olive, silver, fancy border					
Candelabra, silver, 5 lights					
Bowls, sugar, one has a top					
Pitcher, cream, French silver, tall					
Pitcher, cream, silver, thread border					
Tea set, 4 pieces, for tray					
Compotes, silver, fancy border					
Coffeepots, French silver, ivory handles					
Teapot, French silver, ivory handle					
Teapot, silver, ebony handle					
Sauce boats, thread border, silver					
Stands, thread border, silver					
Tongs, sugar, silver, thread pattern					
Ladles, sauce, silver, thread pattern					
Ladles, sauce, silver, beaded pattern					
Ladles, soup, silver, thread pattern					
Knife, pie, silver, beaded pattern					
Dishes, bonbon, silver, Gorham, fancy border.					
Dishes, bonbon, silver, Gorham, open-work border.					
Dishes, bonbon, gilt, fancy border					
Spoons, serving, French silver, thread border.					
Kettle and stand, tea, silver, with eagle, ornamental handle; kettle is made to tip.					
Compotes, silver, fancy border, open-work.					
Toast rack, silver					
Toast rack, silver plated					
Tureen, soup, stand, inside and top marked "President's House."					
Platter, French plated, large, fancy border.					
Platters, French plated, medium, thread border.					
Plates, French plated					
Pitcher, cream, silver, ivory handle					
Pot, hot water, silver, ivory handle					
Caster, wine, silver, thread border, for 2 decanters.					
Casters, salt, French plated, for 2 cellars each.					
Knives, fruit, gilt					
Sifter, sugar, gilt, thread pattern					
Spoons, berry, gilt, thread pattern					
Forks, dinner, silver, beaded					
Dishes, vegetable, silver, round, with handle on the side.					
Casters, wine, silver, fancy border					
Spoons, salt, gilt, thread pattern					
Casters, wine, silver, fancy borders, with tops.					
Tureens, soup, silver; 3 parts each, stand, inside, and top; top has eagle ornament for handle.					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
		57		57				1907. June 30	57	Good.
		22		22				do	22	Do.
		1		1				do	1	Do.
		8		8				do	8	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		5		5				do	5	Do.
		2		2				do	2	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		12		12				do	12	Do.
		12		12				do	12	Do.
		12		12				do	12	Do.
		8		8				do	8	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		5		5				do	5	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		48		48				do	48	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		95		95				do	95	Do.
		2		2				do	2	Do.
		11		11				do	11	Do.
		10		10				do	10	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Silver-plated ware.					
Spoons, table					
Spoons, tea, German silver					
Spoons, tea, stamped "President's House."					
Forks, stamped "President's House"					
Knives, ivory handles					
Knives, plated					
Trays, with handles, large English plate, marked "President's House."					
Candelabra, 5 lights, Gorham plate					
Candelabra, 5 lights					
Pot, coffee, "International"					
Dishes, butter					
Casters, wine					
Casters, table					
Dish, chafing					
Pitchers, water					
Pitchers, water, fancy border					
Pitchers, water, large, plain					
Trays, for pitchers					
Trays, for pitchers, fancy border					
Tea set, for tray, plain					
Stand, tall, for bouquet holder					
Candlestick, plain					
Bottle labels, silver	6	Jan. 24, 1907	$2.25	$13.50	Berry & Whitmore Co.
Holders, ramekin					
Nutcrackers					
Lamps, spirit					
Nut pickers, pearl handles					
Nut pickers, plated					
Urn, capacity 3 quarts, coffee					
Holders, bottles					
Glassware.					
Vases, glass					
Bowls, finger (Coat of arms)					
Plates, ice cream (Coat of arms)					
Glasses, sherry, stem (Coat of arms)					
Glasses, claret (Coat of arms)					
Bowls, champagne (Coat of arms)					
Tumblers, champagne (Coat of arms)					
Glasses, Burgundy (Coat of arms)					
Goblets (Coat of arms)					
Plates, ice cream (Coat of arms)					
Decanters					
Saltcellars					
Bottles, water					
Dish, celery, flat					
Glasses, punch					
Dishes, berry, oblong					
Bowls, rose					
Bowl					
Dishes, berry					
Dishes, olive, with handles					
Dishes, olive, without handles					
Dishes, olive					
Bottles, water					
Glasses, Sauterne, green					
Glasses, Burgundy, ruby					
Glasses, Burgundy, ruby					
Glasses, liqueur					
Bowls, finger					
Dishes, sauce					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		32		32				June 30	32	Good.
		8		8				do	8	Do.
		281		281				do	281	Do.
		300		300				do	300	Do
		38		38				do	38	Do.
		19		19				do	19	Do.
		2		2				do	2	Do.
		10		10				do	10	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		3		3				do	3	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		3		3				do	3	Do.
		2		2				do	2	Do.
		6		6				do	6	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
74 26	Feb. 25, 1907 Mar. 26, 1907		6	6				do	6	Do.
		24		24				do	24	Do.
		15		15				do	15	Do.
		4		4				do	4	Do.
		5		5				do	5	Do.
		11		11				do	11	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		10		10				June 30	10	Good.
		82		82				do	82	Do.
		70		70				do	70	Do.
		83		83				do	83	18 broken, 65 good.
		92		92				do	92	Good.
		89		89				do	89	Do.
		65		65				do	65	Do.
		77		77				do	77	Do.
		91		91				do	91	7 broken, 84 good.
		12		12				do	12	Good.
		7		7				do	7	Do.
		24		24				do	24	Do.
		26		26				do	26	Do.
		1		1				do	1	Do.
		173		173				do	173	Do.
		6		6				do	6	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		7		7				do	7	Do.
		2		2				do	2	Do.
		18		18				do	18	Do.
		40		40				do	40	Do.
		96		96				do	96	Do.
		63		63				do	63	Do.
		24		24				do	24	Do.
		19		19				do	19	Do.
		21		21				do	21	Do.
		51		51				do	51	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Glassware—Continued.					
Plates, ice cream					
Bowls, sugar					
Glasses, sherry					
Glasses, Rhine wine					
Glasses, claret					
Glasses, punch, tall, with handles					
Glasses, celery					
Decanters, tall					
Stoppers, cut glass					
Glasses, Madeira, ruby					
Glasses, port					
Glasses, liqueur, engraved, Roman border, old.					
Glasses, sherry, engraved, Roman border, old.					
Glasses, champagne, engraved, Roman border, old.					
Glasses, sherry, engraved with vine, odd					
Glasses, liqueur, stem, engraved with vine, odd.					
Glasses, Sauterne, engraved with vine, odd.					
Glasses, white wine, engraved with vine, odd.					
Glasses, claret, engraved with vine, odd					
Glasses, Rhine wine, engraved with vine, odd.					
Glasses, Burgundy, engraved with vine, odd.					
Bowls, finger, engraved with vine, odd					
Bottles, water, engraved with vine, odd					
Dishes, berry, engraved with vine, odd					
Decanters, with handles, engraved with vine, odd.					
Decanters, engraved with vine, odd					
Bottle, water, cut glass					
Glasses, cocktail, engraved with star					
Glasses, Roman punch					
Glasses, Madeira, engraved Roman border.					
Glasses, claret, engraved Roman border					
Glasses, Burgundy, engraved Roman border.					
Romers, engraved, vine border					
Bowls, large, used with gilt plateau in state dining room.					
Dishes, bonbon, iridescent					
Stands, cake, high					
Dishes, berry, high					
Dishes, celery, engraved vine border					
Decanters, with handles					
Vases					
Saltcellars, individual					
Tumblers dozen					
Pitchers, cut glass	2	Oct. 10, 1906	$3.50	$7.00	Dulin & Martin Co
Glasses, water, cut glass	12	Oct. 31, 1906		57.20	Galt & Bro.
Glasses, apollinaris, cut glass	36	do		148.50	do
Glasses, champagne, cut glass	12	do		55.00	do
Glasses, sherry, cut glass	54	do		222.75	do
Bowls, finger, cut glass	36	do		171.60	do
Glasses, brandy and soda, cut glass	36	Dec. 24, 1906		225.00	do

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		11		11				June 30	11	Good.
		2		2				do	2	Do.
		52		52				do	52	Do.
		7		7				do	7	Do.
		28		28				do	28	Do.
		25		25				do	25	Do.
		4		4				do	4	Do.
		17		17				do	17	Do.
		10		10				do	10	Do.
		54		54				do	54	Do.
		63		63				do	63	Do.
		19		19				do	19	Do.
		64		64				do	64	Do.
		37		37				do	37	Do.
		16		16				do	16	Do.
		26		26				do	26	Do.
		42		42				do	42	Do.
		64		64				do	64	Do.
		71		71				do	71	Do.
		4		4				do	4	Do.
		27		27				do	27	Do.
		35		35				do	35	Do.
		23		23				do	23	Do.
		3		3				do	3	Do.
		6		6				do	6	Do.
		6		6				do	6	Do.
		1		1				do	1	Broken.
		18		18				do	18	Good.
		20		20				do	20	Do.
		71		71				do	71	Do.
		14		14				do	14	Do.
		31		31				do	31	Do.
		20		20				do	20	Do.
		2		2				do	2	Do.
		24		24				do	24	Do.
		3		3				do	3	Do.
		3		3				do	3	Do.
		3		3				do	3	Do.
		3		3				do	3	Do.
		4		4				do	4	Do.
		11		11				do	11	Do.
		18½		18½				do	18½	20 broken.
42	Nov. 16, 1906		2	2				do	2	Good.
50	Nov. 17, 1906		12	12	2	Broken; worthless.		do	10	Do.
50	do		36	36				do	36	Do.
50	do		12	12				do	12	Do.
50	do		54	54				do	54	Do.
50	do		36	36				do	36	Do.
76	Jan. 31, 1907		36	36	1	Broken; worthless.		do	35	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Chinaware.					
Teapots					
Toilet sets					
Cups ..... dozen	1	Jan. 17, 1907		$0.75	Dulin & Martin Co.
Saucers ..... do	1	do		.75	do
Ewers, china					
Basins, china					
Dishes, soap					
Bowl					
Mugs					
Vases					
Chambers, china					
Jars, slop					
Dish, butter					
Bowls, oatmeal					
Platters					
Dishes, vegetable					
Bowls					
Pitchers, water					
Plates, egg	24	Apr. 16, 1907		5.00	Dulin & Martin Co.
Dish, chocolate	1	Mar. 9, 1907		2.25	do
[Lincoln set.]					
Plates, soup					
Plates, dinner					
Plates, breakfast					
Platters, fish ..} red border, with eagle					
Plate, bread ..} in center.					
Pitchers					
Compotes					
Stands, cake					
Stands, pyramid					
Stands, fruit					
Bowls, punch					
Platters					
[Grant set.]					
Plates, soup; yellow border					
Plates, dinner; flowers painted in center					
Stands, cake					
Stands, fruit					
Compotes					
Plates, soup; plain yellow band					
Platters, meat					
Platters, fish					
Plates, soup					
Plates, soup, small; yellow, with flowers					
Plates, dinner; painted in center					
[Hayes set.]					
Plates, soup; decorated by Theo. Davis					
Plates, dinner; decorated by Theo. Davis.					
Plates, oyster; decorated by Theo. Davis.					
Plates, game; decorated by Theo. Davis					
Plates, fish; decorated by Theo. Davis					
Plates, cracker and cheese; decorated					
Plates, punch					
Plates, dessert					
Plates, salad					
Dishes, gravy boats					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		2		2				June 30	2	Good.
		3		3				do	3	Do.
37	Feb. 19, 1907	2½	1	3½				do	3½	Do.
37	do	2½	1	3½				do	3½	Do.
		3		3				do	3	Do.
		2		2				do	2	Do.
		7		7				do	7	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		2		2				do	2	Do.
		6		6	3	Broken; worthless.		do	3	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		4		4				do	4	2 good, 2 broken.
		8		8	4	Broken; worthless.		do	4	Good.
		4		4				do	4	Do.
		2		2				do	2	Do.
40	May 24, 1907		24	24				do	24	Do.
39	Apr. 24, 1907		1	1				do	1	Do.
		6		6				June 30	6	Good.
		56		56				do	56	Do.
		37		37				do	37	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		16		16				do	16	Do.
		12		12				do	12	Do.
		3		3				do	3	Do.
		9		9				do	9	Do.
		2		2				do	2	Do.
		7		7				do	7	Do.
		10		10				June 30	10	Good.
		3		3				do	3	Do.
		5		5				do	5	Do.
		5		5				do	5	Do.
		8		8				do	8	Do.
		20		20				do	20	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		8		8				do	8	Do.
		13		13				do	13	Do.
		29		29				do	29	Do.
		25		25				June 30	25	Good.
		59		59				do	59	Do.
		48		48				do	48	Do.
		32		32				do	32	Do.
		6		6				do	6	Do.
		50		50				do	50	Do.
		36		36				do	36	Do.
		70		70				do	70	Do.
		7		7				do	7	Do.
		2		2				do	2	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Chinaware—Continued.					
[Hayes set.]—Continued.					
Platter, fish					
Platters, game; ornamented with picture of canvasback duck.					
Platters, meat; turkey decorations					
Platters, ice cream; ornamented with picture of snowshoe.					
Cups and saucers, coffee; odd shape					
Cups, coffee; after-dinner					
[Arthur set.]					
Plates, dessert, odd					
Cups and saucers, Dresden, small					
Plate, dessert					
[Cleveland set.]					
Plates, dessert, turquoise					
Plates, dessert, ivory and gold					
Plates, dessert, odd					
Plates, dessert, scalloped edge, blue					
Plates, dinner, blue border					
Plates, dinner, red and gold					
Plates, dinner, pink and gold border					
Plates, breakfast, green and gold					
Platter, ice cream, pink and gold					
Plates, ice cream, pink and gold					
Dishes, bonbon, flags of nations					
Plates, breakfast, rolled edge					
Cups, tea					
Saucers, tea					
Cups, after-dinner					
Saucers, after-dinner					
Plates, Haviland, odd					
Plate, deep, red, dinner					
Plates, rolled edge					
[Harrison set.]					
Plates, soup					
Plates, dinner					
Plates, breakfast					
Plates, bread and butter					
Plates, dinner					
Plates, breakfast					
[McKinley set.]					
Plates, oyster					
Plates, dessert, rose border					
Plates, breakfast, green and gold border					
Plates, breakfast, blue and garland of roses.					
Plates, butter, individual					
Cups, coffee, white and green					
Saucers, coffee, white and green					
Bowls, blue and white					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		2		2				do	2	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		8		8				do	8	Do.
		17		17				do	17	Do.
		25		25				June 30	25	22 good. 3 broken.
		5		5				do	5	Good.
		1		1				do	1	Do.
		95		95				June 30	95	Good.
		18		18				do	18	Do.
		13		13				do	13	Do.
		11		11				do	11	9 good, 2 broken.
		84		84				do	84	Good.
		84		84				do	84	83 good, 1 broken.
		95		95				do	95	93 good, 2 broken.
		96		96				do	96	92 good, 4 broken.
		1		1				do	1	Good.
		3		3				do	3	Do.
		18		18				do	18	15 good, 3 broken.
		393		393				do	393	383 good, 10 broken.
		191		191				do	191	Good.
		190		190				do	190	Do.
		190		190				do	190	178 good, 12 broken.
		193		193				do	193	Good.
		3		3				do	3	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		92		92				June 30	92	Good.
		80		80				do	80	Do.
		70		70				do	70	Do.
		55		55				do	55	Do.
		15		15				do	15	Do.
		26		26				do	26	Do.
		24		24				June 30	24	Good.
		24		24				do	24	16 good, 8 broken.
		24		24				do	24	Good.
		12		12				do	12	Do.
		22		22				do	22	7 good, 15 broken.
		5		5				do	5	Good.
		11		11				do	11	Do.
		6		6				do	6	5 good, 1 broken.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Chinaware—Continued.					
[McKinley set—Continued.]					
Pitchers, blue and white					
Plates, soup, deep, red border					
Pitcher, small, blue					
Jar, cracker, Haviland					
Ornament, China "Hen on nest"					
Bowl, punch, high stand, blue and white					
Ash receiver, shell, imitation					
Ramakins, French china					
Cups, tea, odd, Haviland					
Cups and saucers, coffee, green and gold border.					
Cups and saucers, large, colored bowl					
Cups, tea, colored bowl					
Cups, after-dinner coffee					
Plate, tea, deep red border					
Plate, breakfast, deep red border					
Plate, dinner, deep red border					
Plates, soup, narrow yellow border					
Plate, dinner, narrow yellow border					
Cups, odd sizes					
Saucers, odd sizes					
[Roosevelt set.]					
White and gold:					
Plates, dinner ... dozen					
Plates, breakfast ... do					
Plates, fish ... do					
Plates, tea ... do					
Plates, soup ... do					
Plates, bread and butter ... do					
Cups and saucers, after-dinner coffee, dozen.					
Cups and saucers, tea ... dozen					
Plates, oyster ... do					
Dishes, 16-inch					
Dishes, 18-inch					
Red and white:					
Cups, bouillon					
Saucers, bouillon					
Linen.					
Pillows					
Doilies					
Tablecloths, 10½ yards long, embroidered "U. S."					
Tablecloth, 5 yards long					
Tablecloth, 9 yards long					
Tablecloth, 6½ yards long					
Tablecloth, 5½ yards long					
Tablecloths, 4 by 3 yards					
Tablecloth, 7 yards long					
Tablecloth 4½ yards long					
Tablecloth, 3 by 3 yards					
Tablecloths, 3 by 3 yards, embroidered "U. S."					
Tablecloths, 4 yards long					
Tablecloths, 2½ yards long; servants'					
Tablecloths, 1½ yards long; servants'					
Tablecloths, 1¼ yards long; cut down from long cloths.					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		2		2				June 30	2	Good.
		9		9				do	9	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		24		24				do	24	Do.
		14		14				do	14	Do.
		15		15				do	15	Do.
		2		2				do	2	Do.
		5		5				do	5	Do.
		9		9				do	9	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		17		17				do	17	Do.
		1		1				do	1	Do.
		18		18				do	18	Do.
		41		41				do	41	Do.
		15		15				June 30	15	14 good, 1 broken.
		10		10				do	10	9 good, 1 broken.
		10		10				do	10	Good.
		10		10				do	10	Do.
		10		10				do	10	Do.
		5		5				do	5	3 good, 2 broken.
		8		8				do	8	4 good, 4 broken.
		10		10				do	10	8 good, 2 broken.
		10		10				do	10	Good.
		12		12				do	12	Do.
		12		12				do	12	Do.
		41		41				do	41	Do.
		41		41				do	41	Do.
		6		6				June 30	6	Good.
		18		18	18	Worn out; worthless.		do	0	
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		8		8				do	8	Do.
		3		3				do	3	Do.
		4		4				do	4	Do.
		4		4				do	4	Do.
		12		12	8	Worn out; worthless.		do	4	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Linen—Continued.					
Covers, sideboard; hemstitched, embroidered "U. S."					
Covers, sideboard, fringed					
Napkins, fringed					
Doilies, embroidered "U. S."					
Napkins, 28½ by 36 inches					
Napkins, large; embroidered "U. S."					
Napkins, large; embroidered "U. S." in red.					
Napkins, breakfast; embroidered "U. S." in red.					
Napkins, poppy pattern; embroidered "U. S." in red.					
Napkins, fern pattern; embroidered "U. S." in red.					
Napkins, fancy border; embroidered "U. S." in red.					
Napkins, flower border; embroidered "U. S." in red.					
Napkins, ribbon border; embroidered "U. S." in red.					
Doilies, Renaissance; open center					
Centerpieces, Renaissance					
Doilies, large, German					
Doilies, medium, German					
Centerpieces					
Centerpiece, 1¼ yards square; Renaissance.					
Centerpiece, embroidered; scalloped edges.					
Doilies, drawn work; small; square; embroidered in silk.					
Doilies, drawn work					
Doilies, square; hemstitched; embroidered in yellow silk.					
Doilies, scalloped edge; embroidered in silk.					
Doilies, appliqué					
Towels, glass, red and blue border					
Felt, table.....pieces					
Sheets, linen; double					
Sheets, linen; three-quarter					
Sheets, cotton; double					
Sheets, cotton; three-quarter					
Pillow slips, wide linen					
Pillow slips, medium					
Pillow slips, medium					
Bolster cases, linen					
Bedspreads, double					
Bedspreads, three-quarter					
Bath towels, fringed					
Bath towels, hemstitched					
Towels, blue border, embroidered "U.S."					
Towels, gold border, embroidered "U. S."					
Towels, crash, servants', embroidered "U. S."					
Towels, crash, servants'					
Towels, fringed, white, old					
Towels, fringed, red, old					
Towels, pink border, embroidered "U.S."					
Rugs, bath, dark brown					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
		23		23				1907. June 30.	23	Old.
		3		3				do	3	Good.
		8		8				do	8	Do.
		55		55	55	Worn out; worthless.		do	0	
		17		17				do	17	Do.
		42		42				do	42	Do.
		9		9				do	9	Old.
		40		40	30	Worn out; worthless.		do	10	Do.
		27		27				do	27	Do.
		31		31	31	Worn out; worthless.		do	0	
		4		4	4	do		do	0	
		45		45				do	45	Good.
		162		162	162	Worn out; worthless.		do	0	
		17		17				do	17	Do.
		1		1				do	1	Do.
		12		12				do	12	Do.
		12		12				do	12	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		21		21				do	21	Do.
		17		17				do	17	Do.
		7		7				do	7	Do.
		8		8				do	8	Do.
		6		6				do	6	Do.
		72		72	72	Worn out; worthless.		do	0	
		9		9				do	9	Do.
		12		12				do	12	Do.
		48		48				do	48	Do.
		7		7				do	7	Do.
		51		51	6	Worn out; worthless.		do	45	Do.
		14		14				do	14	Do.
		45		45	10	Worn out; worthless.		do	35	Do.
		20		20	5	do		do	15	Do.
		11		11				do	11	Do.
		21		21				do	21	Do.
		7		7				do	7	Do.
		28		28	8	Worn out; worthless.		do	20	Do.
		24		24				do	24	Do.
		65		65	65	Worn out; worthless.		do	0	
		100		100	100	do		do	0	
		88		88	28	do		do	60	Do.
		46		46	26	do		do	20	Do.
		20		20				do	20	Do.
		72		72				do	72	Do.
		15		15				do	15	Do.
		6		6				do	6	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Linen—Continued.					
Doilies, Turkish					
Scarf, bureau, hemstitched					
Scarf, with blue lining					
Doilies, lace					
Covers, stand, edged with lace					
Pillow shams, ruffled					
Pillow shams, lace ... pair					
Pillow shams, hemstitched and embroidered, pairs.					
Pillow shams, lace edge ... pair					
Pillow shams, sheet					
Cover, table, lace edge					
Cover, table, fringed					
Spreads, bed					
Blankets ... pair					
Sheets, linen					
Doilies, hemstitched					
Napkins, hemstitched					
Napkins, embroidered					
Doilies					
Tablecloths					
Doilies, finger bowl	84	Jan. 15, 1907		$28.00	Woodward & Lothrop.
Blanket, bed	1	Jan. 4, 1907		7.50	do
Storeroom.					
Hose, ¾-inch, 4-ply ... feet					
Cooler, water, porcelain lined					
Stands, music, iron, used by band					
Chairs, wooden					
Platform, wooden, used by leader of band					
Mat, cocoa					
Baskets, wood					
Racks, skeletons, coat					
Tags, brass, used at receptions ... lot					
Table leaves, oak, belong to extension table.					
Wheelbarrow, used in engine room					
Shovels, coal					
Ax, short handle					
Ax, long handle					
Truck with rubber-tired wheels					
Fan, electric, 16-inch					
Comforts, bed					
Pails, swill					
Pails, water					
Scoop, sugar					
Brushes, hair					
Combs					
Pads, table, felt					
Stencils, brass ... set					
Chairs, folding ... dozen					
Hamper, clothes					
Coal chute, canvas					
Tennis marker					
Washboards					
Pitcher, covered					
Dishes, soap					
Rat-traps					
Mouse traps					
Dishes, soap					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		45		45				June 30	45	Good.
		30		30				do	30	Do.
		2		2	1	Worn out; worthless.		do	1	Do.
		3		3				do	3	Do.
		9		9				do	9	Do.
		12		12				do	12	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		3		3	1	Worn out; worthless.		do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		40		40				do	40	Do.
		1		1				do	1	Do.
		11		11				do	11	Do.
		12		12				do	12	Do
		36		36				do	36	Do.
		72		72				do	72	Do.
		12		12				do	12	Do.
		24		24				do	24	Do.
98	May 31, 1907		84	84				do	84	Do.
98	do	2	1	3	1	Burned; worthless	The President	do	2	Do.
		400		400	400	Transferred to storehouse.		June 30	0	Good.
		1		1				do	1	Do.
		84		84				do	84	Do.
		25		25	5	Broken; worthless.		do	20	
		1		1				do	1	Do.
		1		1				do	1	Old.
		1		1				do	1	Good.
		6		6				do	6	Do.
		1		1				do	1	Old.
		4		4				do	4	Good.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		6		6	3	Worn out; worthless.		do	3	Do.
		10		10	4	do		do	6	Do.
		1		1				do	1	Do.
		3		3	3	Worn out; worthless.		do	0	
		3		3	3	do		do	0	
		3		3				do	3	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		12		12				do	12	Do.
		1		1				do	1	Do.
		4		4	2	Broken; worthless		do	2	Do.
		3		3	3	Not found		do	0	
		6		6				do	6	Old.
		2		2				do	2	Good.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Storeroom—Continued.					
Mat, door					
Do					
Spade, small					
Spade, No. 2					
Toilet set					
Pitchers					
Brush					
Comb					
Brooms					
Tent tops, marquee					
Fans, electric					
Gloves, rubber ....pairs					
Picks, ice					
Jackets, duck					
Baskets, scrap					
Basket for silver					
Vases, glass					
Ladder, hub					
Ladder, step					
Tennis net					
Cuspidor, china					
Candle stand, brass					
Laces, Renaissance ....pairs					
Spring, double					
Pitchers					
Colanders, tin					
Lemon squeezer, aluminum					
Plates, pie					
Biggin, coffee					
Bread raisers					
Grater					
Boilers, double					
Masher, potato					
Wringer for clothes					
Washboards					
Chair, oak					
Wringers for clothes					
Laces, Renaissance ....pairs					
Pitchers					
Dustpans					
Shades, mica ....dozen					
Shades, candle					
Uniforms, livery					
Funnel					
Brushes, hearth					
Baskets, lunch					
Pails					
Pail					
Napkins					
Cloth, table					
Cloths, table					
Napkins					
Do					
Cloths, table					
Do					
Do					
Do					
Pad, rubber stamp					
Tubs, wash, wooden	4	Aug. 24, 1906	$1.60	$6.40	Dulin & Martin Co.
Sweepers, carpet	3	Oct. 3, 1906		17.50	do

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1					1	Do.
		1		1				June 30	1	Do.
		6		6				do	6	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		12		12	6	Worn out		do	6	Do.
		2		2				do	2	Do.
		2		2					2	Do.
		2		2					2	Do.
		6		6				June 30	6	Do.
		24		24	18	Worn out; used as cleaning cloths.		do	6	
		2		2				do	2	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		1		1	1	Transferred to storehouse.		do	0	
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Broken.
		1		1				do	1	Good.
		1		1				do	1	Worn out
		1		1				do	1	Good.
		6		6				do	6	Do.
		3		3	3	Worn out; worthless.		do	0	
		1		1	1	do		do	0	
		6		6				do	6	Old.
		1		1				do	1	Good.
		2		2	1	Worthless		do	1	Old.
		1		1				do	1	Good.
		3		3				do	3	1 good; 2 old.
		1		1				do	1	Good.
		1		1				do	1	Do.
		6		6	6	Worn out; worthless.		do	0	
		1		1				do	1	Do.
		2		2	2	Transferred to storehouse.		do	0	
		5		5				do	5	Old.
		6		6	6	Broken; worthless		do	0	
		18		18				do	18	9 good; 9 old.
		17		17				do	17	Good.
		76		76				do	76	Do.
		2		2				do	2	Do.
		1		1				do	1	Do
		12		12	6	Worn out		do	6	Do.
		2		2				do	2	Do.
		3		3				do	3	Do.
		1		1				do	1	
		12		12				do	12	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		180		180				do	180	Do.
		120		120				do	120	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		8		8				do	8	Do.
		1		1				do	1	Do.
48	Sept. 21, 1906		4	4				do	4	Do.
42	Nov. 16, 1906	20	3	23	10	Broken; worthless		do	13	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Storeroom—Continued.					
Jackets, waiters	12	Sept. 10, 1906	.....	$18.00	Woodward & Lothrop
Aprons, waiters	18	....do	.....	8.25	....do
Sweepers, carpet	3	Dec. 20, 1906	$4.50	13.50	Dulin & Martin Co
Kitchen.					
Shades, window					
Table, pine					
Cups, fish ....dozen					
Coffeepot, granite					
Knife and fork, carving					
Pots, granite					
Boiler, meat					
Bowls, china					
Pitchers, china					
Cups, china					
Plates, china					
Broiler, oyster					
Strainer, soup					
Shaker, pepper					
Boiler, fish					
Measure, quart					
Squeezer, lemon					
Plates, pie, granite					
Plates, pie, tin					
Pans, bake, iron					
Rollers, towel					
Grater					
Knives, potato					
Basins, paper					
Tables, pine					
Pans, sauce, copper					
Kettle, stock, copper					
Boilers, fish, copper					
Boiler, ham	1	Sept. 10, 1906	.....	1.25	Dulin & Martin Co
Bowl, beating, copper					
Braziers, copper					
Sugar melter, copper					
Molds, fancy, large, jelly, copper					
Molds, fancy					
Molds, plain, copper					
Pan, melting, copper, for sugar					
Molds, tin, fancy					
Molds, brick ice cream, tin					
Molds, round, tin					
Molds, melon, tin					
Mortar, marble					
Pestles, for mortar					
Rack, galvanized iron					
Molds, lead, individual, ice cream					
Block, meat, round					
Chopper, meat, "Enterprise"					
Boards, oak					
Cleavers					
Saw, meat					
Ladles, soups and sauces					
Molds, tin, individual, small					
Molds, tin, individual, medium					
Cutters, vegetable					
Cutters, cake, fancy					
Molds, block, tin, small					
Molds, block, tin, medium					
Molds, block, tin, pyramid					
Formers, pastry, cup					
Mold, tin, cone-shape					
Molds, flat, pear-shaped, small					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
98	May 31, 1907	....	12	12	....			June 30	12	Good.
98	....do....	....	18	18	....			....do...	18	Do.
31	Jan. 22, 1907	....	3	3	....			....do...	3	Do.
....		2	....	2	....			June 30	2	Good.
....		1	....	1	....			....do...	1	Do.
....		2	....	2	....			....do...	2	Do.
....		1	....	1	....			....do...	1	Do.
....		1	....	1	....			....do...	1	Do.
....		13	....	13	6	Broken; worthless		....do...	7	Do.
....		1	....	1	....			....do...	1	Do.
....		12	....	12	11	Broken; worthless		....do...	1	Old.
....		12	....	12	5	....do....		....do...	7	Do.
....		12	....	12	....			....do...	12	Good.
....		12	....	12	12	Broken; worthless		....do...	0	
....		1	....	1	1	....do....		....do...	0	
....		1	....	1	....			....do...	1	Do.
....		1	....	1	....			....do...	1	Do.
....		1	....	1	....			....do...	1	Do.
....		1	....	1	....			....do...	1	Do.
....		1	....	1	1	Broken; worthless		....do...	0	
....		3	....	3	3	....do....		....do...	0	
....		6	....	6	6	....do....		....do...	0	
....		6	....	6	....			....do...	6	Do.
....		2	....	2	....			....do...	2	Do.
....		1	....	1	....			....do...	1	Do.
....		6	....	6	4	Not found		....do...	2	Do.
....		2	....	2	....			....do...	2	Do.
....		4	....	4	....			....do...	4	Do.
....		24	....	24	....			....do...	24	Do.
....		1	....	1	....			....do...	1	Do.
....		2	....	2	....			....do...	2	Do.
45	Oct. 24, 1906	1	1	2	....			....do...	2	Do.
....		1	....	1	....			....do...	1	Do.
....		2	....	2	....			....do...	2	Do.
....		1	....	1	....			....do...	1	Do.
....		9	....	9	....			....do...	9	Do.
....		19	....	19	....			....do...	19	Do.
....		4	....	4	....			....do...	4	Do.
....		1	....	1	....			....do...	1	Do.
....		4	....	4	....			....do...	4	Do.
....		5	....	5	....			....do...	5	Do.
....		8	....	8	....			....do...	8	Do.
....		2	....	2	....			....do...	2	Do.
....		1	....	1	....			....do...	1	Do.
....		2	....	2	....			....do...	2	Do.
....		1	....	1	....			....do...	1	Do.
....		24	....	24	....			....do...	24	Do.
....		1	....	1	....			....do...	1	Do.
....		1	....	1	....			....do...	1	Do.
....		2	....	2	....			....do...	2	Do.
....		2	....	2	....			....do...	2	Do.
....		1	....	1	....			....do...	1	Do.
....		2	....	2	....			....do...	2	Do.
....		71	....	71	....			....do...	71	Do.
....		16	....	16	....			....do...	16	Do.
....		3	....	3	....	Worn out; worthless.		....do...	0	Do.
....		6	....	6	4	....do....		....do...	2	Do.
....		64	....	64	....			....do...	64	Do.
....		14	....	14	....			....do...	14	Do.
....		23	....	23	....			....do...	23	Do.
....		2	....	2	....			....do...	2	Do.
....		1	....	1	....			....do...	1	Do.
....		28	....	28	....			....do...	28	Do.

Inventory of public property, Executive Mansion, June 30, Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Kitchen—Continued.					
Cutters, pastry					
Chair, arm, painted red					
Freezers, ice cream					
Shaker, pepper					
Coffee mill					
Clock, 8-day, wooden					
Pan, baking, patent, double					
Baskets, frying, iron					
Pots, porcelain-lined					
Waffle iron					
Molds, cake, tin, large, round					
Pans, drip					
Steamer					
Steamer, patented					
Kettle, tea, iron					
Colanders, tin					
Pan, bread					
Boiler, double, agate ware					
Crocks					
Bowls, white					
Pans, dish, tin					
Pans, frying					
Broilers, wire					
Plates, pie					
Pans, muffin, Russian ware					
Pans, bread, Russian ware					
Colanders	2	Sept. 10, 1906	$0.30	$0.60	Dulin & Martin Co
Pans, roll, Russian ware					
Grater, nutmeg					
Knife, chopping					
Strainers, gravy, tin					
Measure, quart, graduated					
Box, knife, walnut					
Funnel, tin					
Grater, bread, tin					
Dredges, tin					
Cans, garbage, galvanized iron, small					
Pan, "Bain Marie," to use on range					
Tureen, soup, yellow ware					
Cups, hotel china, white					
Saucers, hotel china, white					
Dishes, vegetable, hotel china					
Platters, hotel china					
Knife, palette, long					
Knife, sabatier, scallop					
Openers, can, 1 nickel and 1 iron					
Corkscrew, wooden handle					
Scoop, potato					
Steel					
Dishes, meat					
Saucepans, assorted ..... dozen					
Kettle, tea					
Boilers					
Griddle					
Boilers, double					
Pans, jelly					
Spoons, iron, assorted					
Washer, lettuce					
Pans, baking					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		5		5				June 30	5	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1	1	Worn out; worthless.		do	0	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		3		3	1	Worn out; worthless.		do	2	Do.
		3		3				do	3	Do.
		24		24	11	Worn out; worthless.		do	13	Do.
								do		
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	No good.
		1		1				do	1	Good.
		1		1				do	1	Do.
		2		2				do	2	Do.
		3		3	3	Broken; worthless		do	0	
		2		2	2	Worn out		do	0	
		25		25	4	do		do	21	Do.
		8		8	4	do		do	4	Do.
		8		8	8	do		do	0	
		2		2				do	2	Do.
		8		8				do	8	Do.
45	Oct. 24, 1906	3	2	5				do	5	Do.
		5		5				do	5	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		7		7	6	Worn-out; worthless.		do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		12		12	7	Broken; worthless		do	5	Do.
		12		12	9	do		do	3	Do.
		6		6	3	do		do	3	Do.
		4		4	4	do		do	0	
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		1		1	1	Worn-out; worthless.		do	0	
		1		1				do	1	Do.
		5		5	5	Worn-out; worthless.		do	0	
		1		1				do	1	Do.
		2		2				do	2	Do.
		8		8				do	8	Do.
		6		6	6	Worn-out; worthless.		do	0	
		1		1				do	1	Do.
		7		7	4	Worn-out; worthless.		do	3	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Kitchen—Continued.					
Muffin rings					
Spoons, table					
Measure, tin					
Shaker, salt					
Measures, tin					
Knife, carving					
Tea caddy					
Forks					
Bowl, chop					
Turners, cake					
Cover, apple					
Shears, sardine ... pair					
Knife, chop					
Can, tin, for flour					
Mold					
Jar, for tea					
Pans					
Cutters, tin ... set					
Steamer					
Cutter, meat					
Colanders					
Pans, dish					
Pans, bread					
Chairs					
Dishes, butter					
Colander					
Dish, butter, covered					
Bowls					
Boilers, oatmeal					
Muffin pan					
Pans, meat					
Pot, bean					
Openers, can					
Molds, fish					
Pans, sauce					
Awning					
Brushes, polishing, electric					
Dishes, bake					
Corers, apple					
Squeezers, lemon					
Boiler, coffee					
Teaspoons					
Box, salt					
Pans, steel					
Skimmers, milk					
Scoops, potato					
Pins, rolling					
Cups and saucers					
Carvers ... sets					
Kettle					
Beaters, egg					
Cans, garbage					
Pans, sauce					
Pans, roast					
Whip, cream					
Pot, stock					
Cups, custard					
Sieves					
Pots, coffee					
Strainers	2	Sept. 10, 1906	$0.25	$0.50	Dulin & Martin Co
Teapots	2	do	.35	.70	do

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907. June 30	18	Good.
		5		5				do	5	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		19		19				do	19	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4	4	Worthless		do	0	
		8		8	8	do		do	0	
		12		12	12	do		do	0	
		9		9	9	do		do	0	
		2		2				do	2	Broken.
		1		1				do	1	Old.
		1		1				do	1	Broken.
		12		12				do	12	Good.
		2		2				do	2	Do.
		1		1	1	Worn-out; worthless.		do	0	
		4		4				do	4	Do.
		1		1				do	1	Do.
		3		3	2	Not found		do	1	Do.
		2		2				do	2	Do.
		20		20	8	Worn-out; worthless.		do	12	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		3		3				do	3	Do.
		6		6	2	Worn-out; worthless.		do	4	Do.
		3		3	1	Broken; worthless		do	2	Do.
		1		1				do	1	Do.
		24		24	12	Not found		do	12	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		4		4				do	4	Old.
		2		2				do	2	Good.
		2		2				do	2	Do.
		6		6				do	6	Broken.
		2		2	1	Worn-out; worthless.		do	1	Good.
		3		3	2	do		do	1	Do.
		2		2	2	do		do	0	
		3		3				do	3	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1	1	Worn-out; worthless.		do	0	
		2		2	1	do		do	1	Do.
		18		18				do	18	Do.
		6		6	2	Worn-out; worthless.		do	4	
		11		11	5	do		do	6	
45	Oct. 24, 1906	4	2	6	2	do		do	4	Do.
45	do	5	2	7	4	Broken; worthless		do	3	Do.

Inventory of public property, Executive Mansion, June 30, 1907— continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Kitchen—Continued.					
Knives	2	Sept. 10, 1906	$0.65	$1.30	Dulin & Martin Co.
Pail	1	do		1.00	do
Boilers, rice	2	Dec. 10, 1906		3.40	do
Molds	4	do		6.25	do
Molds, ice cream	4	do		2.50	do
Bowls, yellow	6	do		3.25	do
Platters	4	do		2.50	do
Chopper, meat	1	Dec. 11, 1906		1.75	do
Pitchers	6	Jan. 24, 1907	.25	1.50	do
Needles, larding ... set	1	Feb. 9, 1907		.75	do
Bowls	12	Apr. 23, 1907		2.20	do
Casseroles	17	Mar. 16, 1907		15.75	do
Kettle, preserving	1	June 22, 1907		.85	do
Engine room.					
Coal hods, galvanized iron					
Shovels, fire, galvanized					
Pump, electric					
Baskets, wood					
Traps, rat					
Plumber's room.					
Square, steel, 2-foot					
Grindstone					
Machine, drilling, and 12 drills					
Stocks and dies ... set					
Pump, Nopple, force and suction					
Plungers, cup					
Trowel, mason's					
Do					
Wrench, monkey					
Tape line, 50-foot, metallic					
Electricians' room.					
Pliers, cutting, 6-inch, side ... pair					
Pliers, Bernard, 6-inch ... do					
Pliers, 6-inch ... do					
Wrench, Stillson, 8-inch					
Screw-driver, 3-inch					
Screw-driver, 6-inch					
File, rat-tail, 6-inch					
Gentlemen's Senatorial dressing room.					
Carpet, Wilton ... yards					
Mirror, over mantle					
Wardrobes, golden oak					
Covers, loose, cotton damask					
Water cooler					
Towels, roller ... dozen					
Wardrobe, oak	1	Mar. 26, 1907		14.50	W. B. Moses & Sons
Ladies' Senatorial dressing room.					
Covers, loose, cotton damask					
Gentlemen's diplomatic dressing room.					
Covers, loose, cotton damask					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
45	Oct. 24, 1906	38	2	40	....			June 30	40	Good.
45	.....do.....	....	1	1	....			....do...	1	Do.
31	Jan. 22, 1907	....	2	2	....			....do...	2	Do.
31	.....do.....	....	4	4	....			....do...	4	Do.
31	.....do.....	....	4	4	....			....do...	4	Do.
31	Jan. 22, 1907	....	6	6	....			....do...	6	Do.
31	.....do.....	....	4	4	....			....do...	4	Do.
31	.....do.....	1	1	2	....			....do...	2	Do.
31	.....do.....	17	6	23	9	Broken; worthless		....do...	14	Do.
18	Mar. 15, 1907	....	1	1	....			....do...	1	Do.
40	May 24, 1907	12	12	24	8	Broken; worthless		....do...	16	Do.
33	June 21, 1907	....	17	17	....			....do...	17	Do.
48	July 27, 1907	....	1	1	....			....do...	1	Do.
....	.....	12	....	12	....			June 30	12	Good.
....	.....	6	....	6	2	Dropped; worthless.		....do...	4	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	12	....	12	....			....do...	12	Do.
....	.....	2	....	2	....			....do...	2	Do.
....	.....	1	....	1	....			June 30	1	Good.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	2	....	2	....			....do...	2	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			June 30	1	Good.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	141½	....	141½	....			June 30	141½	Good.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	2	....	2	....			....do...	2	Do.
....	.....	6	....	6	....			....do...	6	Do.
....	.....	1	....	1	....			....do...	1	Do.
....	.....	3	....	3	....			....do...	3	Do.
37	Apr. 24, 1907	....	1	1	....			....do...	1	Do.
....	.....	9	....	9	....			June 30	9	Good.
....	.....	8	....	8	....			June 30	8	Good.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
GROUND FLOOR—continued.					
Diplomatic assembly reception room.					
Carpet, Wilton.....yards..	....	.....	.....	.....	.....
Sofas, with backs and arms, gilded wood frames, upholstered in blue damask.	....	.....	.....	.....	.....
Chairs, arm, same as above.....	....	.....	.....	.....	.....
Chairs, without arms, same as above....	....	.....	.....	.....	.....
Divan, circular, gilded wood frame, 6 legs, etc.	....	.....	.....	.....	.....
Ladies' diplomatic dressing room.					
Covers, loose, cotton damask.....	....	.....	.....	.....	.....
Corridor.					
Drapery, satin damask, red.....pairs..	....	.....	.....	.....	.....
Settees, reupholstered in satin damask..	....	.....	.....	.....	.....
Settees, oak frames, upholstered in red .	....	.....	.....	.....	.....
Arm chairs, oak frames, upholstered in red.	....	.....	.....	.....	.....
Covers, loose, cotton damask.....	....	.....	.....	.....	.....
Pads, silk velour, for china closets.....	15	Dec. 31, 1906	.....	$30.95	W. B. Moses & Sons.
Carpet, red, Wilton.....yards..	474¾	Jan. 24, 1907	$2.45	1,163.14	W. & J. Sloane, New York.
Cabinet, china.....	1	Jan. 31, 1907	.....	48.50	The Washn. Wood Working Co.
Do.....	1	May 9, 1907	.....	48.50	.....do.....
WEST TERRACE.					
Servants' dining room.					
Table, dining, plain.....	....	.....	.....	.....	.....
Chair, youth's.....	....	.....	.....	.....	.....
Tablecloths.....	....	.....	.....	.....	.....
Napkins.....	....	.....	.....	.....	.....
Bowls, oatmeal.....	....	.....	.....	.....	.....
Plates, soup.....	....	.....	.....	.....	.....
Cups, egg.....	....	.....	.....	.....	.....
Bowls, sugar.....	....	.....	.....	.....	.....
Pitchers.....	....	.....	.....	.....	.....
Knives.....	....	.....	.....	.....	.....
Spoons, tea.....	....	.....	.....	.....	.....
Forks.....	....	.....	.....	.....	.....
Cruets, salt.....	....	.....	.....	.....	.....
Cruets, pepper.....	....	.....	.....	.....	.....
Chairs.....	....	.....	.....	.....	.....
Cruets, glass.....	....	.....	.....	.....	.....
Teapots.....	....	.....	.....	.....	.....
Machine, sewing, "Domestic".....	....	.....	.....	.....	.....
Table, extension, 8-foot, golden oak.....	....	.....	.....	.....	.....
Sideboard, golden oak.....	....	.....	.....	.....	.....
Matting, white china .....yards..	....	.....	.....	.....	.....
Shade, window.....	....	.....	.....	.....	.....
Cups and saucers.....dozen..	....	.....	.....	.....	.....
Dishes, butter.....	....	.....	.....	.....	.....
Plates.....dozen..	....	.....	.....	.....	.....
Beds, maple, double.....	2	June 30, 1907	.....	.....	Trans. from attic.....

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		115½		115½				June 30	115½	Good.
		4		4				do	4	Do.
		4		4				do	4	Do.
		8		8				do	8	Do.
		1		1				do	1	Do.
		12		12				June 30	12	Good.
		2		2				June 30	2	Good.
		4		4				do	4	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		5		5				do	5	Do.
32	Jan. 22, 1907		15	15				do	15	Do.
81	Jan. 31, 1907	365½	474¾	840¼				do	840¼	Do.
55 82	Feb. 19, 1907 May 27, 1907	4	2	6				do	6	Do.
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		10		10				do	10	Do.
		36		36	26	Worn out		do	10	Do.
		12		12				do	12	4 good; 8 broken.
		12		12				do	12	Good.
		6		6				do	6	Do.
		2		2				do	2	Do.
		4		4				do	4	Do.
		9		9				do	9	Do.
		20		20				do	20	Do.
		12		12				do	12	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		9		9				do	9	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Old.
		1		1				do	1	Good.
		1		1				do	1	Do.
		40		40				do	40	Do.
		2		2				do	2	Do.
		4		4	2	Broken; worthless.		do	2	Do.
		2		2				do	2	Do.
		4		4	4	Broken; worthless.		do	0	
			2	2	1	Dropped from returns; carried by mistake.		do	1	Do.

Inventory of public property, Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
WEST TERRACE—continued.					
Servants' dining room—Continued.					
Tumblers	24	Feb. 4, 1907		$1.30	Dulin & Martin Co
Cups and saucers	24	do		2.40	do
Servants' rooms.					
Carpet, Wilton yards					
Matting, white china do					
Bed, iron					
Mattresses, hair					
Spring, woven wire					
Pillows, feather					
Mattress					
Chair, arm, upholstered					
Rocker, wicker					
Chair, arm, high back, painted red					
Rocker, cherry					
Table, pine					
Bureau, ash					
Washstand, ash					
Comforters					
Toilet set					
Desk, oak					
Chairs, wicker					
Mirror, oak frame					
Stand, shaving, mahogany					
Bed, small, iron					
Wardrobe, walnut					
Chairs, spline seat					
Washstand, mahogany					
Curtains, cotton damask					
Bedstead, enamel and brass, with spring					
Mattress, cotton					
Comfort, bed					
Matting, white china yards					
Beds, iron, 3′ by 6′					
Mattresses, hair and cotton					
Chairs, arm, upholstered in green rep					
Laundry.					
Irons, polishing					
Baskets					
Irons					
Cooler, water					
Stoves, gas, 2-burner, with 8 small iron heaters.					
Stove, gas, 2-burner, with 2 sadiron heaters.					
Tables, pine, large					
Board, bosom					
Wardrobe, maple					
Truck, flat, with rubber-tired wheels					
Iron holders					
Iron stands					
Boiler					
Wringers					
Rolls, wringer					
Washboards					
Boards, ironing					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
18	Mar. 15, 1907	39	24	63	48	Broken; worthless.		1907. June 30	15	Good.
18	....do.....	48	24	72	48	....do.....		....do...	24	Do.
		65		65				June 30	65	Good.
		370		370				....do...	370	Old.
		1		1				....do...	1	Good.
		3		3				....do...	3	Do.
		1		1				....do...	1	Do.
		3		3				....do...	3	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Old.
		2		2				....do...	2	Good.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		3		3				....do...	3	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		2		2				....do...	2	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		2		2				....do...	2	Do.
		1		1				....do...	1	Do.
		2		2				....do...	2	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		245		245				....do...	245	Do.
		2		2				....do...	2	Do.
		2		2				....do...	2	Do.
		2		2				....do...	2	Do.
		4		4				June 30	4	Good.
		2		2				....do...	2	Do.
		32		32				....do...	32	Do.
		1		1				....do...	1	Do.
		4		4				....do...	4	Do.
		1		1				....do...	1	Do.
		4		4				....do...	4	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		1		1				....do...	1	Do.
		12		12	6	Worn out; worthless.		....do...	6	Do.
		11		11	3	Broken; worthless		....do...	8	Do.
		1		1				....do...	1	Do.
		2		2				....do...	2	Do.
		2		2				....do...	2	Do.
		18		18	6	Broken; worthless		....do...	12	Do.
		3		3				....do...	3	Do.

Inventory of public property, Executive Mansion, June 3, 1907—Continued.

Description	Number of pieces	Location	Cost		Bought from—
[illegible]					
[illegible]					
[illegible]					
[illegible]					
[illegible]

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposal of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		42		42				June 30	42	Good.
		1		1				do	1	Do.
		24		24				do	24	Do.
		24		24				do	24	Do.
		24		24				do	24	Do.
		1		1				June 30	1	Good.
		20		20				do	20	Do.
		6		6				do	6	Do.
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
32	Jan. 22, 1907		1	1				do	1	Do.
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				June 30	1	Good.
		20		20				do	20	Do.
		6		6				do	6	Do.
		31		31				June 30	31	Good.
		72		72				do	72	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
66	Mar. 30, 1907		300	300				do	300	Do.
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		6		6				do	6	Do.
		3		3				do	3	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		273½		273½				do	273½	Do.
		56		56				do	56	Do.
		36		36				do	36	Do.
35	Feb. 19, 1907	1	2	3				do	3	Do.
		2		2				do	2	Do.
		6		6				do	6	Do.
		4		4				do	4	Do.
		6		6				do	6	Do.
		2		2				do	2	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
MISCELLANEOUS LIST—continued.					
Desk					
Shade, lamp; cut					
Vases					
Lamp, silver					
Chairs, wooden ... dozen					
Covers, furniture; cotton damask					
Stands, music					
Table, pine; used in state dining room; covered with green baize.					
Scale, platform; Fairbanks No. 11					
Hose, air; black rubber ... feet					
Stand, mahogany; marble top					
Boxes, hat ... lot					
Carpet, Wilton; red					
Desk, walnut					
Pail, galvanized iron					
Chairs, splan seat					
Mirror, toilet					
Costumers, mahogany					
Bench, oak, with green velour cushion					
Screen, 4-fold, covered with rep					
Screen, 4-fold, covered with tapestry					
Curtains, red flax velour, lined with silk, put up with poles, pairs.					
Boxes, wooden					
Reels, hose					
Sprayer, automatic, and rods					
Settee, rustic					
Table, rustic					
Chairs, arm, white enamel					
Settees, white enamel					
Extinguishers, fire					
Rubber tubing used on fire extinguishers, feet.					
Bottles, fire extinguisher					
Padding ... yards					
Damask, cotton ... do					
Table, rustic					
Detector, time, watchman's					
Wrench, Coes					
Shades, candelabra, silk					
Curtains, window, imperial Swiss, pairs					
Jardinieres					
Water can					
Wood baskets					
Cuspidors					
Hangers, coat					
Hangers, trousers					
Comfort					
Combs					
Ladder					
Mats, white rubber					
Matting, cocoa ... yards					
Screens, silk					
Hangers, coat					
Shades, lamp					
Screen, porch, 8 by 13 feet					
Stretcher					
Canopy					
Screen, canvas, for grounds					
Curtain, canvas					
Hammock					
Bronze eagle					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		36		36				do	36	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		271		271				do	271	Do.
		5		5				do	5	Do.
		1		1				do	1	Old.
		1		1				do	1	Broken, no good.
		200		200				do	200	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		13		13				do	13	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		4		4				do	4	Do.
		2		2				do	2	Do.
		30		30				do	30	Do.
		50		50				do	50	Do.
		3		3				do	3	Do.
		8½		8½				do	8½	Do.
		57¾		57¾				do	57¾	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		10		10				do	10	Do.
		1		1				do	1	Do.
		72		72				do	72	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		4		4				do	4	Do.
		24		24				do	24	Do.
		24		24				do	24	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		6		6				do	6	Do.
		83		83				do	83	Do.
		15		15				do	15	Do.
		24		24				do	24	Do.
		5		5				do	5	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description.	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
MISCELLANEOUS LIST—continued.					
Chairs, oak					
Carpet, Wilton, red					
Rack, hat, walnut					
Chairs, walnut, perforated seats					
Cuspidor, china					
Chair, arm, walnut, upholstered in leather.					
Stand, wash, walnut					
Bowl and pitcher, white china					
Bottle, leather					
Fender, brass					
Brooms, whisk					
Fans, electric					
Carpet, green velvet ... yards					
Hammers					
Chambers					
Covers, cotton damask, for chandeliers, etc.					
Mats, cocoa	2	Sept. 28, 1906		$21.50	Dulin & Martin Co.
Stretcher, carpet	1	Sept. 6, 1906		1.15	do.
Scale, Howe, 400 pounds	1	Sept. 18, 1906		18.00	F. P. May & Co.
Shades, window, white Holland	10	Sept. 15, 1906		23.85	W. B. Moses & Sons.
Shades, electric, white and pink silk	100	Nov. 14, 1906	$0.45	45.00	Nat'l Elec. Supply Co.
Hods, coal	20	Sept. 27, 1906	.35	7.00	W. S. Jenks
Chair pads, velvet	303	Dec. 24, 1906	1.37½	416.63	James B. Henderson.
Shade roller, tin	1	Jan. 31, 1907		.85	W. B. Moses & Sons.
Duster handles, bamboo	2	Jan. 2, 1907	5.50	11.00	Dulin & Martin Co.
Baskets, for wood	6	Feb. 4, 1907		18.00	do.
Brushes, floor polishers	4	Feb. 28, 1907	.75	3.00	Barber & Ross
Curtains, wedgewood cloth, for tennis court.	4	Mar. 25, 1907		114.85	W. B. Moses & Sons.
Hamper, clothes	1	Apr. 11, 1907		3.50	Dulin & Martin Co.
Rat traps	2	Apr. 18, 1907	.50	1.00	do.
Brushes, hair	2	Jan. 30, 1907	.65	1.30	Woodward & Lothrop
Combs	2	do.	.25	.50	do.
Linoleum ... yards	13¼	Sept. 15, 1906	1.50	19.88	W. B. Moses & Sons.
Mat, cocoa	1	Oct. 23, 1906		2.40	Dulin & Martin Co.
Do	4	Nov. 6, 1906	7.50	30.00	W. B. Moses & Sons.
Baskets	5	May 2, 1907		4.55	Woodward & Lothrop
Baskets, clothes	3	June 5, 1907		12.75	Dulin & Martin Co.
PRESIDENT'S OFFICE BUILDING.					
Globe, geographical					
Map frame					
PRESIDENT'S STABLE.					
Stove, small, and pipe					
Boiler, copper, for heating water					
Hose, rubber, ¾-inch ... feet					
Stove, No. 40, "Comet," with pipe					
Hose, rubber, 1-inch, 3-ply ... feet					
Hods, coal					
Shades, window					
Trap, rat					
Oilcloth ... yards					
Table sections used at state dinners					
Trusses for table used at state dinners					
Stove					
Linoleum, inlaid ... yards					

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No.	Date.							Date.	Quantity.	
								1907.		
....	.....	3	....	3	....	.....	.....	June 30	3	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	1	Not found.....	.....	....do...	0	
....	.....	3	....	3	....	.....	.....	....do...	3	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	1	Broken; worthless.	.....	....do...	0	
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	18	....	18	6	Worn out.....	.....	....do...	12	Fair.
....	.....	4	....	4	....	.....	.....	....do...	4	Good.
....	.....	68	....	68	....	.....	.....	....do...	68	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	8	....	8	....	.....	.....	....do...	8	Do.
....	.....	49	....	49	....	.....	.....	....do...	49	Do.
45	Oct. 24, 1906	....	2	2	....	.....	.....	....do...	2	Do.
49	.....do.....	....	1	1	....	.....	.....	....do...	1	Do.
55	.....do.....	....	1	1	....	.....	.....	....do...	1	Do.
69	Oct. 25, 1906	....	10	10	....	.....	.....	....do...	10	Do.
46	Dec. 26, 1906	....	100	100	....	.....	.....	....do...	100	Do.
27	Jan. 22, 1907	....	20	20	....	.....	.....	....do...	20	Do.
29	.....do.....	....	303	303	....	.....	.....	....do...	303	Do.
35	Feb. 19, 1907	....	1	1	....	.....	.....	....do...	1	Do.
37	.....do.....	....	2	2	....	.....	.....	....do...	2	Do.
18	Mar. 15, 1907	9	6	15	....	.....	.....	....do...	15	Do.
47	Mar. 23, 1907	....	4	4	....	.....	.....	....do...	4	Do.
37	Apr. 24, 1907	....	4	4	....	.....	.....	....do...	4	Do.
40	May 24, 1907	1	1	2	....	.....	.....	....do...	2	Do.
40	.....do.....	....	2	2	....	.....	.....	....do...	2	Do.
98	May 31, 1907	3	2	5	....	.....	.....	....do...	5	Do.
98	.....do.....	....	2	2	....	.....	.....	....do...	2	Do.
69	Oct. 25, 1906	....	13½	13½	....	.....	.....	....do...	13½	Do.
42	Nov. 16, 1906	....	1	1	....	.....	.....	....do...	1	Do.
76	Dec. 29, 1906	....	4	4	....	.....	.....	....do...	4	Do.
55	June 22, 1907	....	5	5	....	.....	.....	....do...	5	Do.
48	July 27, 1907	....	3	3	....	.....	.....	....do...	3	Do.
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	1	....	1	....	.....	.....	June 30	1	Good.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	20	....	20	....	.....	.....	....do...	20	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	100	....	100	....	.....	.....	....do...	100	Do.
....	.....	2	....	2	....	.....	.....	....do...	2	Do.
....	.....	15	....	15	....	.....	.....	....do...	15	Do.
....	.....	1	....	1	1	Not found.....	.....	....do...	0	
....	.....	6⅔	....	6⅔	....	.....	.....	....do...	6⅔	Do.
....	.....	12	....	12	....	.....	.....	....do...	12	Do.
....	.....	16	....	16	....	.....	.....	....do...	16	Do.
....	.....	1	....	1	....	.....	.....	....do...	1	Do.
....	.....	17½	....	17½	....	.....	.....	....do...	17½	Do.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Description	Number or quantity.	Received.	Cost.		Bought from—
			Unit.	Total.	
STABLE OF PUBLIC BUILDINGS AND GROUNDS.					
Comb, curry					
Scraper, sweat					
Horse, bay					
Blankets, horse					
Surcingle					
Boots, rubber ....pair					
Brush, horse					
Brushes, mane					
Robe, lap					
Mare, bay					
Wagon, Dayton, with top and two seats					
Harness, single ....set					
Harness, single, Concord					
Blanket, woolen, for street use					
Blanket, stable					
Blanket, rubber					
Robes, light-weight, for wagon					
Robe, fur					
Boots, ankle ....pair					
Boots, calking ....do					
Cover, horse					
Storm front, for wagon					
Net, fly	1	July 23, 1906		$3.00	Lutz & Co
Soaking pads, felt ....pair	1	....do		1.25	....do
Muzzle, wire, for horse	1	Sept. 5, 1906		1.75	....do
Clippers, horse ....pair	1	Jan. 24, 1907		4.00	....do
Sheet, horse, summer	1	May 17, 1907		3.00	....do
Brush, dandruff	1	June —, 1907		.75	....do
STOREHOUSE AT PROPAGATING GARDENS.					
Seats, upholstered, for elevator					
Table, oval, large, pine					
Desk, walnut, carved ornaments					
Sofas, in frame, 1 upholstered					
Sofa, upholstered in green damask					
Matting, cocoa ....yards					
Extinguishers, fire, Babcock's					
Stoves, gas, 4-tube					
Wardrobe, walnut					
Matting, white china ....yards					
Spring, double					
Basket					
Carpet, Wilton, red ....yards					
Table, walnut, marble top					
Wardrobe, mahogany					
Emery wheel, 4-inch					
Matting, cocoa ....yards					
Stove					
Metal board to go under stove					
Desk, walnut					
Cabinet, carved, mahogany, tall					
Laces, window					
Brushes, wire					
Mirror, gilt frame					
Rug, green, Wilton carpet	1	June 30, 1907			Transferred from southwest bedroom.
Hose, ¾ inch 4-ply ....feet	400	....do			Transferred from storeroom.
Ladder, hub	1	....do			....do
Wringers, for clothes	2	....do			....do
Sweepers, carpet	10	....do			....do
Hangings, window curtains and draperies, blue silk rep, from Blue Room, pairs.	3	....do			Transferred from Blue Room.
Curtains, red velours, from main corridor, pairs.	2	....do			Transferred from main corridor.

Inventory of public property, Executive Mansion, June 30, 1907—Continued.

Voucher.		On hand last return.	Received since last return.	Total to be accounted for.	Disposed of since last return.	Method and date of disposal.	Authority for disposal.	On hand.		Condition, etc.
No	Date.							Date.	Quantity.	
								1907.		
		1		1				June 30	1	Good.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		3		3				do	3	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
		1		1				do	1	Do.
73	Sept. 28, 1906		1	1				do	1	Do.
73	do		1	1				do	1	Do.
31	Nov. 15, 1906		1	1				do	1	Do.
66	Feb. 20, 1907		1	1				do	1	Do.
38	June 21, 1907	1	1	2				do	2	Do.
37	July 27, 1907	3	1	4				do	4	Do.
		2		2	2	Sold at auction	The President	June 30	0	
		1		1	1	do	do	do	0	
		1		1	1	do	do	do	0	
		2		2				do	2	Old.
		1		1				do	1	Do.
		14		14				do	14	Do.
		2		2				do	2	Do.
		2		2	2	Sold at auction	The President	do	0	
		1		1				do	1	Do.
		8833		8833	8833	Sold at auction	The President	do	0	
		1		1				do	1	Do.
		1		1	1	Sold at auction	The President	do	0	
		178		178				do	178	Do.
		1		1	1	Sold at auction	The President	do	0	
		1		1				do	1	Do.
		1		1	1	Not found		do	0	
		113		113	113	Sold at auction	The President	do	0	
		1		1	1	do	do	do	0	
		1		1	1	do	do	do	0	
		1		1				do	1	Do.
		1		1				do	1	Do.
		2		2				do	2	Do.
		4		4	4	Sold at auction	The President	do	0	
		1		1				do	1	Good.
			1	1				do	1	Do.
			400	400				do	400	Do.
			1	1				do	1	Do.
			2	2				do	2	Do.
			10	10				do	10	Do.
			2	2				do	2	Do.
			2	2				do	2	Do.

APPENDIX III.

NORTHERN AND NORTHWESTERN LAKES—CORRECTING AND ISSUING CHARTS—SURVEYS—WATER LEVELS—PRESERVATION OF NIAGARA FALLS.

REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 1907—OFFICERS OF THE CORPS OF ENGINEERS IN CHARGE, LIEUT. COL. JAMES L. LUSK, UNTIL JULY 30, 1906; COL. GARRETT J. LYDECKER, UNTIL APRIL 20, 1907, AND MAJ. CHARLES KELLER, TO THE END OF THE FISCAL YEAR.

UNITED STATES ENGINEER OFFICE,
Detroit, Mich., July 9, 1907.

GENERAL: I have the honor to submit herewith annual report on survey of the Northern and Northwestern Lakes for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

CHARLES KELLER,
Major, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

NORTHERN AND NORTHWESTERN LAKES—CORRECTING AND ISSUING CHARTS—SURVEYS—WATER LEVELS.

As early as 1816 local surveys of the Great Lakes for special purposes were made by engineer officers, but the survey of the Northern and Northwestern Lakes as a connected and systematic whole was commenced in 1841 and prosecuted continuously until 1882, when work was suspended, as the data then in hand seemed sufficient for the requirements of navigation of the period. After the suspension and until 1889 operations were limited to the publication and issue of charts, $2,000 or $3,000 being appropriated annually for this work. In 1889 field operations were resumed under an appropriation made therefor, and have been continued under annual appropriations ranging from $5.000 to $150,000. In 1898 these operations were extended to include observations and investigations of lake levels with a view to ascertaining the causes of changes in level, determining the hydraulic data needed for formulating the laws of interlake flow, and devising the most feasible method of lake-level maintenance or regulation.

Operations during the last fiscal year have included work related to the several features above referred to, as follows:

Charts.—The following statement shows the number of charts received and disposed of at this office during the fiscal year ending June 30, 1907:

On hand July 1, 1906	44,207
Received from Chief of Engineers, U. S. Army	2
Prepared in this office	19,308
Returned from office files	1
Total	63,518
Sold	13,795
Issued for official use	3,115
Transferred to United States engineer office, Buffalo, N. Y	3,113
Destroyed (out of date)	491
On hand July 1, 1907	43,004
Total	63,518

The total number of charts sold by this office during the year was 13,795, the total amount received from these sales being $2,176.65, which was duly deposited to the credit of the Treasurer of the United States. The total number of charts that have been sold, issued, and transferred through this office to June 30, 1907, is 339,927, including issues to the United States engineer office at Buffalo.

In continuation of the policy of eventually issuing all Lake Survey charts in colors, of keeping constantly revised to date all charts after their issue, and of preparing such additional coast and harbor charts as the interests of navigation seem to require, work as outlined below has been performed in this office during the year. The revisions of charts embraced changes in aids to navigation, modifications due to river and harbor improvements, latest magnetic determinations, additional and corrected sailing courses, and the most prominent topographic and hydrographic changes developed by commercial and industrial enterprise on the shores of the lakes and their tributary and connecting waters. The changes constantly being made in lights and buoys, pier extension and breakwater construction, etc., render necessary a very large amount of hand work, as every chart is corrected for all information received to the day it is sent out of the office.

Copies of the following-named copperplate charts were revised to be used as guides by the engravers in correcting the copperplates:

1. Coast Chart No. 1, Lake Michigan; scale, 1:80,000.
2. Lake St. Clair; scale, 1:50,000.
3. Coast Chart No. 6, Lake Erie; scale, 1:80,000.
4. South end of Green Bay; scale, 1:120,000.
5. South Fox Island Shoals; scale, 1:20,000. (Original engraved on stone.)
6. Sandusky Bay; scale, 1:20,000.
7. St. Marys River No. 2; scale, 1:40,000.
8. St. Lawrence River No. 1; scale, 1:30,000.
9. General Chart of Lake Ontario; scale, 1:400,000.
10. Buffalo Harbor and Niagara River to the Falls; scale, 1:30,000.
11. Harbor at Duluth, Minn., and Superior, Wis.; scale, 1:18,000.
12. Cleveland Harbor and Cuyahoga River, Ohio; scale, 1:12,000.
13. Erie Harbor and Presque Isle, Pennsylvania; scale, 1:15,000.
14. Marquette and Presque Isle Harbors, Michigan; scale, 1:15,000.
15. Eagle Harbor, Michigan; scale, 1:5,000.
16. Beaver Island Group, including the northeast end of Lake Michigan; scale, 1:120,000; with inset of Beaver Harbor, Michigan; scale, 1:15,000.

17. Coast Chart No. 1, Lake Ontario; scale, 1:80,000.
18. Agate and Burlington Bays, Minnesota; scale, 1:6,000.
19. Coast Chart No. 5, Lake Michigan; scale, 1:80 000.
20. Coast Chart No. 5, Lake Ontario; scale, 1:80,000.
21. Coast Chart No. 8, Lake Superior, including Isle Royal; scale, 1:120,000.
22. St. Lawrence River No. 6; scale, 1:30,000.

Revisions of copies of the following copperplate charts are in hand:

1. Straits of Mackinac; scale, 1:120,000. For 4th edition in colors.
2. Detroit River; scale, 1:40,000; with inset of Lower Detroit River; scale, 1:20,000. Results of resurveys made in 1906–7 along the city front being added, also changes showing available channels and aids to navigation in Lower Detroit River.

Copperplates were revised and corrected, transferred to stone, and the charts printed in colors as follows:

1. Huron Bay and Huron Islands, Lake Superior; scale, 1:30,000. Results of local surveys made in 1905 added. The first edition in colors. Issued July 6, 1906.
2. Apostle Islands No. 2, including Chequamegon Bay and South Coast of Lake Superior; scale, 1:50,000. The second edition in colors from heliogravure plates. Issued July 6, 1906.
3. Coast Chart No. 2, Lake Michigan; scale, 1:80,000. Results of survey of Sheboygan Harbor, Wisconsin, and additional and amended sailing courses added. The first edition in colors. Issued July 20, 1906.
4. Lake St. Clair; scale, 1:50,000. Local survey in Baltimore Bay made in 1905, and survey in connection with widening St. Clair Flats Canal added. The fourth edition in colors. Issued August 1, 1906.
5. Coast Chart No. 2, Lake Erie; scale, 1:80,000. Chart limits extended to include Erie Harbor and Long Point, with amended and additional sailing courses added. The first edition in colors. Issued August 24, 1906.
6. North end of Lake Michigan; scale, 1:400,000. Results of surveys made between the years 1903 and 1905, amended and additional sailing courses, and many topographic and hydrographic changes added. The first edition in colors. Issued October 8, 1906.
7. Coast Chart No. 6, Lake Erie; scale, 1:80,000. Results of survey of Upper Sandusky Bay and Pelee Island made in 1904 and 1905 added. The third edition in colors. Issued October 24, 1906.
8. St. Marys River No. 2; scale, 1:40,000. Widening and deepening of available channels, changes in aids to navigation, and much topographic and hydrographic information added. The fourth edition in colors. (Third edition from heliogravure copperplates.) Issued November 10, 1906.
9. South end of Green Bay; scale, 1:120,000. Extensive changes and additions in topography and hydrography obtained from surveys of 1904, 1905, and 1906 embodied. The first edition in colors. Issued January 30, 1907.
10. Coast Chart No. 1, St. Lawrence River; scale, 1:30,000. Changes in topography and hydrography added. The second edition in colors. Issued February 11, 1907.
11. Beaver Island Group, including the Northeast end of Lake Michigan; scale 1:120,000; with new inset of Beaver Harbor; scale, 1:15,000. The results of the surveys of 1904 and 1905, and the locations of many uncharted shoals added. The second edition in colors. Issued February 15, 1907.
12. Buffalo Harbor and Niagara River to the Falls; scale, 1:30,000. Changes in harbor improvements, aids to navigation, and other topographic and hydrographic information added. The fourth edition in colors. Issued February 28, 1907.
13. General Chart of Lake Ontario; scale, 1:400,000. St. Lawrence River from Howe Island to Alexandria Bay, Niagara River, and Welland Canal extended to chart limits; additional and corrected sailing courses, changes in aids to navigation, and much topographic and hydrographic information added. The third edition in colors. Issued March 7, 1907.
14. Harbor at Duluth, Minn., and Superior, Wis.; scale, 1:18,000. Hydrographic and topographic changes to date added. The fifth edition in colors. (The second edition from Molitor process copperplates.) Issued March 30, 1907.

15. Erie Harbor and Presque Isle, Pennsylvania; scale, 1:15,000. Changes in topography and hydrography added. The second edition in colors. Issued May 10, 1907.
16. Eagle Harbor, Michigan; scale, 1:5,000. The results of the topographic and hydrographic surveys of September, 1906, added. The first edition in colors. Issued May 15, 1907.
17. Sandusky Bay, Ohio; scale, 1:20,000. Widening and deepening of dredged channels, changes in aids to navigation, and other topographic and hydrographic features added. The third edition in colors. Issued May 30, 1907.
18. Marquette and Presque Isle Harbors, Michigan; scale, 1:15,000. Results of survey made in 1906 added. The second edition in colors (first edition from Molitor process copperplates). Issued June 27, 1907.
19. Coast Chart No. 1, Lake Michigan; scale, 1:80,000. Results of surveys of Manitowoc and Sturgeon Bay Harbor of Refuge, and additional and amended sailing courses added. The first edition in colors. Issued June 29, 1907.

The preceding edition of the following new chart engraved on stone having been exhausted, a new edition revised to date was issued:

South Fox Island Shoals; scale, 1:20,000. The second edition in colors. Issued August 31, 1906.

Revisions of copperplates preparatory to new editions of the following charts are in hand:

1. Cleveland Harbor and Cuyahoga River, Ohio; scale 1:12,000. Extensive changes from local harbor surveys added to heliogravure copperplate. The third edition in colors, to be issued about July 10, 1907.
2. Agate and Burlington Bays, Minnesota, North shore of Lake Superior; scale 1:6,000. Wharves and breakwater extensions and other topographic and hydrographic changes added. The second edition in colors (first edition from Molitor process copperplate), to be issued about July 17, 1907.
3. Coast Chart No. 1, Lake Ontario; scale 1:80,000. Chart limits extended to include the missing portion of St. Lawrence River from Wolfe Island Light to Round Island, with amended and additional sailing courses. The plate is ready for transfer to stone for the third edition in colors.
4. Coast Chart No. 5, Lake Ontario; scale 1:80,000. The extensive revision of the copperplate of this chart, based on resurveys of Niagara River, is completed and ready for transfer to stone for the first edition in colors.
5. Coast Chart No. 5, Lake Michigan; scale 1:80,000. Extensive changes in topography and hydrography in vicinities of Calumet Harbor, Indiana Harbor, and Gary., Ind., and additional and amended sailing courses are being added. The revision of this copperplate is nearly ready for second edition in colors.
6. St. Lawrence River No. 6; scale 1:30,000. The revision of the copperplate is nearly completed for third edition in colors.
7. Straits of Mackinac; scale 1:120,000. Revision of copperplate is well advanced for fourth edition in colors.
8. Detroit River; scale 1:40,000; with inset of Lower Detroit River; scale 1:20,000. Extensive changes and additions in topography and hydrography are being made on the copperplate, obtained from recent surveys of 1906 and 1907, for seventh edition in colors.

The following entirely new charts were completed and issued in colors during the year:

1. Portage Lake, Manistee County, Mich.; scale 1:10,000. Reduced from survey of 1905. Engraved on stone. Issued July 18, 1906.
2. Coast Chart No. 6, Lake Superior; west end of lake, from Little Girl Point, Michigan, to Beaver Bay, Minnesota, including the Apostle Islands; scale 1:120,000; with inset of Port Wing Harbor, Wisconsin; scale 1:8,000. Compiled from surveys made between the years 1859 and 1905. Engraved on stone. Issued August 1, 1906.
3. General Chart of Lake Erie, including the waterways between Lakes Ontario and Huron; scale 1:400,000. Compiled from surveys made between the years 1859 and 1905. Engraved on stone. Issued August 31, 1906.

4. Racine Harbor, including Racine Reef and Wind Point Shoals; scale 1:15,000. Compiled from surveys made in 1904 and 1905. Engraved on stone. Issued January 18, 1907.
5. Menominee Harbor, Michigan, including the cities of Marinette, Wis., and Menominee, Mich.; scale 1:15,000. Reduced from survey made in 1905. Engraved on stone. Issued January 18, 1907.
6. Les Cheneaux Islands and northeasterly approaches to Straits of Mackinac, from Beaver Tail Reef to St. Martin Bay, including Mackinac and Round Islands; scale 1:40,000. Compiled and reduced from surveys made in 1904, 1905, and 1906. Engraved on stone. Issued March 14, 1907.
7. Coast Chart No. 4, Lake Superior, from Big Bay Point to Ontonagon, including the Keweenaw Peninsula; scale 1:120,000. Compiled from surveys made between the years 1855 and 1905. Engraved on stone. Issued May 15, 1907.

In addition to the foregoing the following new charts are well advanced:

1. Munising Harbor, Michigan, Lake Superior; scale 1:8,000. Reduced from survey made in 1906. Engraved on stone. To be issued about July 15, 1907.
2. Harbors at Ogdensburg, N. Y., and Prescott, Ontario, St. Lawrence River; scale 1:10,000. Compiled from survey made in 1902. Engraved on stone. To be issued about July 25, 1907.
3. General Chart of Northern and Northwestern Lakes; scale 1:1,200,000. Compiled and reduced from the general charts of the Lakes, showing the most direct sailing courses, aids to navigation, lines of equal magnetic variation, annual water-level curves and comparative elevations, dry docks and canals. Engraving on stone completed, verified, and ready for transfer and printing in colors.
4. North end of Lake Michigan, including Green Bay; scale 1:240,000. Compiled and reduced from the latest surveys made between the years 1901 and 1906. Engraving on stone in progress.
5. Harbor at Grand Haven, Mich., including Spring Lake and Lower Grand River; scale 1:15,000. Reductions based on surveys made in 1905 and 1906 completed and engraving on stone in progress.
6. Lake Winnebago, Wisconsin; scale 1:40,000. Reductions from surveys made under the direction of Maj. W. V. Judson, Corps of Engineers, U. S. Army, completed and the engraving on stone in two sections in progress.
7. Entrance to Green Bay, Lake Michigan, from Poverty Island Passage to Porte des Morts Passage (including Drisco Shoal); scale 1:40,000. Reductions based on resurveys made in 1905 and 1906 completed. To be engraved on stone.
8. Black Lake, Lake Michigan, including City of Holland; scale 1:15,000. Reductions based on survey made in 1906 completed. To be engraved on stone.
9. Pine Lake, including Charlevoix Harbor, Lake Michigan; scale 1:30,000. Reductions for this new chart, based on the survey made in 1906, completed. To be engraved on stone.

The following small charts, not considered as forming part of the regular series of Lake Survey charts, were prepared as insets for the bulletins and supplements:

1. St. Clair Flats Canal, Michigan, showing new 300-foot channel, opened September 3, 1906; scale 1:30,000. Engraved on stone and printed in colors. Inset in Supplement No. 5 to Bulletin No. 16, September 20, 1906.
2. Rogers, Mich., Lake Huron; scale 1:12,000. Engraved on stone from survey made in August, 1905, and printed in colors. Inset in Bulletin No. 17, April, 1907.
3. Nahma, Mich., Big Bay de Noc, Green Bay; scale 1:15,000. Engraved on stone from survey made in 1906, and printed in colors. Inset in Bulletin No. 17, April, 1907.
4. New Shoals in vicinity of Sister Bay and Eagle Harbor, including Strawberry Channel, Green Bay; scale 1:60,000. Reduced and engraved on stone. Inset in Bulletin No. 17, April, 1907.
5. Lower Detroit River, showing available channel and positions of aids to navigation at opening of season of 1907; scale 1:20,000. Reprint by transfer from revised and corrected Molitor process copperplate chart. Printed in colors. Inset in Bulletin No. 17, April, 1907

6. St. Clair Flats Canal, Michigan, showing new 300-foot channel and positions of aids to navigation at opening of season of 1907; scale 1 :30,000. Engraving of this inset revised. Reprint in colors. Inset in Bulletin No. 17, April, 1907.
7. Magnetic Chart of the Northern and Northwestern Lakes, showing lines of equal compass variation and lines of equal dip for 1907; scale 1:4,500,000. Engraved on stone and printed in black and red. Inset in Bulletin No. 17, April, 1907.
8. Chart of Magnetic Variations, West End of Lake Superior; scale 1:400,000. Reprint by transfer from Moliter process copperplate in black. Inset in Bulletin No. 17, April, 1907.
9. Index Chart of the Northern and Northwestern Lakes, showing designations and limits of the published charts to date; scale 1 :4,500,000. Engraved on stone and printed in colors. Inset in Bulletin No. 17, and catalogue of charts, April, 1907.
10. Limekiln Crossing, Detroit River, showing recent changes in available channels and posititons of aids to navigation, May, 1907; scale 1 :20,000. Extract from corrected copperplate (Moliter process). Printed in colors. Inset in Supplement No. 1 of Bulletin No. 17, May 27, 1907.
11. Vicinity of Sault Ste. Marie, Mich. and Ontario, showing American and Canadian Canals; scale 1 :15,000. Reprint from engraving on stone in colors for Col. Chas. E. L. B. Davis, Corps of Engineers; statistical report of Canal Traffic during the season of 1906, April 10, 1907.

The following copperplate charts were transferred to stone and a limited number of copies printed, in black only, to supply the immediate demand, previous to their more extensive revision for printing in colors:

1. Lower Reach of Saginaw River; scale 1:10,000.
2. Niagara Falls; scale 1:20,000.

In addition to the work enumerated above, photolithographic reproductions were made in this office of the following:

1. Lake Minnetonka, Minnesota; scale 1:20,000. This chart was photolithographed and printed in colors for Lieut. Col. Geo. McC. Derby, Corps of Engineers, St. Paul, Minn., August 6, 1906.
2. Map of the Department of Dakota; scale 1:1,000,000. Reduced by photolithography from scale of 1 inch=12 miles. Printed in black in 3 sections for Engineer Officer, Department of Dakota, June 5, 1907.

The engravings on stone of the charts listed below were reproduced on copperplates by a transfer and etching process originated by Assistant Engineer Edward Molitor. With some slight retouching by hand, and recutting and roughing the heavy lines and large lettering to retain the ink, exact reproductions of the original engravings are obtained. These copperplates can be revised and transferred to stone for printing in the usual way whenever a new edition is desired. This method of chart construction combines the advantages of stone engraving, which is faster and less expensive than copper engraving, with the desirable feature of copperplates, which are better adapted than stone to making the corrections required in revision for a new edition, and are more easily handled and stored. The stones can be repeatedly polished off and used for new work, which is an essential element in economical lithography, avoiding the necessity of preserving the engravings on the costly lithograph stones and the consequent increase in the number of such stones required to accomplish the same amount of work. The charts thus treated during the year are:

1. Northwest Coast of Lake Superior, for Coast Chart No. 8; scale 1: 120,000, originally engraved on two stones, now on one plate 22 by 28 inches.
2. Charlevoix Harbor, Michigan; scale 1: 8,000.

3. Little Bay de Noc, Green Bay; scale 1:40,000; with inset of Escanaba Harbor and Gladstone Harbor, both to scale 1:20,000.
4. Huron Harbor, Ohio; scale 1:5,000.
5. Presque Isle and Middle Islands, Lake Huron; scale 1:40,000.
6. Manitowoc Harbor, Wisconsin; scale 1:8,000.
7. Tawas Harbor, Michigan; scale 1:16,000.
8. Manistee Harbor, Michigan; scale 1:10,000.
9. Ludington Harbor, Michigan; scale 1:5,000.
10. Lower Detroit River; scale 1:20,000; inset to chart of Detroit River, scale 1:40,000.
11. Portage Lake Harbor, Manistee County, Mich.; scale 1:10,000.
12. Sheboygan Harbor, Wisconsin; scale 1:10,000.
13. Coast Chart No. 1, Lake Superior; scale 1:120,000.
14. Coast Chart No. 6, Lake Huron; scale 1:120,000; with inset of Point au Baril Harbor, French River Harbor, Alexander and Charles Inlet, and Depot Harbor, all to scales of 1:24,000; and Byng Inlet and approaches, scale 1:60,000.

The original series consisted of 76 charts, all of which were printed from copperplates. As a result of revisions, additions, and cancellations, there are now in force 114 Lake Survey charts, of which 4 are printed in black from copperplates, 68 are lithographs in colors from copperplate transfers, 39 are lithographs in colors from stone engravings, and 3 are photolithographs in colors.

To complete the series of Lake Survey charts about 30 new coast and harbor charts remain to be prepared from new and existing surveys.

Of the entire series of charts there had been issued in colors 5 on July 1, 1900; 12 on July 1, 1901; 30 on July 1, 1902; 49 on July 1, 1903; 59 on July 1, 1904; 73 on July 1, 1905; 97 on July 1, 1906, and 110 on July 1, 1907.

The methods of work inaugurated six years ago have proven entirely successful and satisfactory, and will be continued, with such improvements as experience may suggest.

The reduction, preparation, and reproduction of charts has continued, as heretofore, under the immediate direction and supervision of Assistant Engineer Edward Molitor, and to him is due great credit for the very large amount of satisfactory work turned out during the year.

Surveys.—The operations of the parties in the field on July 1, 1906, are described in the following extract from the annual report of Principal Assistant Engineer Francis C. Shenehon:

At the beginning of the fiscal year, six parties were in the field, engaged in the following work: The survey of the Niagara River from Echota to Lake Ontario; the triangulation of the north end of Lake Michigan, in which two parties collaborated, and surveys in Green Bay; the triangulation of Lake Huron; harbor surveys, Lake Michigan; surveys in the vicinity of Isle Royal, Lake Superior. On August 13, a seventh party set out to make observations in Lake Superior on magnetic conditions, as bearing on the mariner's compass.

Survey of Niagara River and west end of Lake Ontario, and hydraulic work on Niagara River.—This work under my own immediate supervision was well under way at the beginning of the year. The party had been assigned to this place for three reasons: First, the original surveys made over thirty years ago antedated the vast development of this region, and made the existing charts obsolete; second, as the diversions of water at Niagara Falls for power purposes were considered to have an effect on the navigable integrity of the Niagara River and of Lake Erie, an investigation of these matters, placed in my hands because of my prior work on the hydraulics of this river, could be carried on jointly with the surveys; third, the steamer *General Williams* on which this

party was dependent for outside hydrographic work was still under reconstruction, owing to delays, and the party was necessarily afoot.

My withdrawal, August 14, left the immediate charge of the party in the hands of my first assistant, Junior Engineer Andrew J. Swift.

By August 1, the tertiary triangulation on which the survey is based, was carried from Echota to the Niagara escarpment overlooking Lewiston, and topography, using plane table, was carried on both sides of the river to below the Whirlpool Rapids.

By October 1, the triangulation was completed to Lake Ontario, and during October the topography was also completed.

On September 30, the steamer *General Williams* reported at Youngstown, and the hydrography of the lower river from Lewiston down, and the lake area approaching the river, which is a region of dangerous shifting shoals, was energetically undertaken. The results of this survey show the old chart to have become obsolete and misleading, and navigation interests, growing out of this examination, will ask for the removal by dredging of the dangerous shoals developed. The serious displacement of the Red Bell Buoy was discovered by this party and reported by wire.

Serious weaknesses having developed in the boilers of two of the Lake Survey steamers, the *Surveyor*, operating in Lake Superior, and the *Search*, in Lake Michigan, it was necessary to withdraw the steamer *General Williams* from this party on November 11, to proceed to the Straits of Mackinac to convoy the disabled steamers. This left the hydrography not quite complete, the party returning to Niagara Falls.

It must be borne in mind that, at the same time this party was executing these surveys, it had in hand also the hydraulic work on the Niagara River which will be described under *Investigation of Lake Levels*.

Triangulation of north end of Lake Michigan.—The object of this work was to connect the triangulation of the system on the east with that of the west side of Lake Michigan, and do it in a single quadrilateral.

At the beginning of the fiscal year the parties under Assistant Engineer Ray on the west shore and of Junior Engineer MacDiarmid at the east were under way, working jointly, each observing on the other's heliotropes. An unprecedented continuation of foggy, smoky weather made the work more formidable than anticipated, and the work at the west end was not completed until August 24. The following stations were occupied by Mr. Ray: Rock Island, Burnt Bluff, Boyers Bluff, and Bark River, using the 10-inch Troughton and Simms theodolite. On days when the air was too thick for primary triangulation, the party under Mr. Ray was usefully employed on various adjacent hydrographic and topographic surveys, detailed later in this report.

Meanwhile, Mr. MacDiarmid, across the lake, using Troughton and Simms theodolite, finished his occupation of △ Northwest Manitou July 7, and began angle reading at △ South Fox July 9. The readings at △ South Fox were completed on August 28. Two stations, one at Pyramid Point and one at entrance to Grand Traverse, were built in July.

Early in September Mr. MacDiarmid moved to △ Beaver, Beaver Island, finished reading angles there, and began angle reading at △ Good Hart, on the main east shore near the post-office of that name. The angles at △ Little Traverse and △ Norwood were read also, using Buff and Berger transit. While at △ Good Hart some days were spent in clearing the line from that station to △ Charlevoix, and a reconnaissance of the country in the vicinity of Little Traverse Bay was made for a secondary system to control surveys of that bay. Two high stations were built, six other stations were targeted and monumented, and a stadia survey was begun at Harbor Springs. The fog and smoke of the fall of the year prevented the completion of the angle reading at △ Good Hart. Work was discontinued November 12, and the party returned to Detroit.

Despite an exceedingly smoky season the main crossing of Lake Michigan was accomplished, and much work done for the control of future hydrographic surveys and toward the much-needed rapid extension of the triangulation down the east shore of Lake Michigan.

Surveys at the north end of Green Bay, Lake Michigan.—As before mentioned, during the days when the air was too thick for primary triangulation, the party under Assistant Engineer Ray was engaged in miscellaneous useful surveys. A land and water survey was made of the harbor at Nahma, Mich.; of Garden Bay, including Garden post-office, and Vans Harbor. Shore line topography was carried from Garden Bluff to Burnt Bluff, and from South

River to Burnt Bluff. The reef south of Indian Point was carefully developed. To control these surveys it was necessary to expand a secondary system of triangulation from the line, Rock Island-Burnt Bluff.

The data secured by these detached surveys permit the revision of the charts that include Big Bay de Noc.

Surveys in vicinity of Sleeping Bear Point, Lake Michigan.—On August 27, the party on the steamer *Search*, under Assistant Engineer Ray, made an examination to locate a rock shoal reported lying off Sleeping Bear Point. An area of 22 square miles was sounded, resulting in the discovery of a 25-foot point 4½ miles west of the Point. While engaged on this work the party was usefully employed on days too stormy for sounding in making a topographic survey extending 5 miles along the shore.

Surveys in the Straits of Mackinac.—The schooner *Eliza Day* having reported striking in the vicinity of Graham shoals, the steamer *Search* was assigned the examination of the region under suspicion, and began the survey September 17. Areas aggregating 8 square miles were covered with close soundings, including the North and South shoals, and Majors shoal.

The results show some changes in the configuration and depths on these shoals, and a well-defined channel between the Graham shoals and the mainland.

Survey on west shore of Green Bay, Lake Michigan.—After completing the work in the Straits the *Search* party made a brief survey in the vicinity of Arthur Bay, including the shore line, docks, and the settlement, and inshore soundings from Point Rochereau to the north of Arthur Bay.

Surveys in the vicinity of Sturgeon Bay Canal, Lake Michigan.—As the fall storms were close at hand when open lake work is much interrupted, the *Search* party was assigned to the survey of the Sturgeon Bay Canal approaches, and began work there on September 27.

The necessary triangulation was executed to base work on Standard datum. The topographical work embraced the canal zone, the shore features for 2 miles each side of lake entrance to the canal, and from Monument Point along Green Bay to Sturgeon Bay; the shore work in that bay and from Sherwood Point about 2 miles southwesterly along the Green Bay shore, including the town of Sawyer and Sturgeon Bay.

Soundings were carried from the shore out to the 10-fathom curve in Green Bay, from Monument Point to about 2 miles southwest of Sherwood Point. Sturgeon Bay and the canal were sounded, and an area of 6 square miles covering the Lake Michigan approach to the canal. The hydrographic work resulted in the discovery of three unknown shoals, one with 17 feet of water, south of Monument Point; the second, a bowlder shoal, with 11.2 feet of water, northwest of Sherwood Point; the third, with 18 feet of water, in Sturgeon Bay about a mile from the canal entrance.

The party completed the survey November 23, arrived in Detroit November 27, and reported for office work. Notwithstanding a season of extraordinary fog, smoke, wind, and rain, the work accomplished by Assistant Engineer Ray is very creditable.

Triangulation of west shore of Lake Huron.—At the beginning of the fiscal year the party on primary triangulation under Junior Engineer H. F. Johnson, working southward from the Straits, had reached △ Laidlaw, abreast of Point Au Sable. Angle reading was completed at △ Laidlaw July 7, and the party successively occupied △ Point Au Sable, △ Point Lookout, △ Charity, on Charity Island; △ West Base and △ East Base, both on Sand Point; △ Oak Point, and △ Port Austin; finishing eight stations. Readings were taken day and night. Meanwhile the gas-pipe station at Point Au Sable was taken down and reerected at Port Austin, that at △ Walker was taken down and rebuilt at Oak Point, and that at △ Wilber was taken down and rebuilt at △ Popple. Timber stations were built at △ East Base, △ West Base, △ Charity, △ Bayport, △ Verona, △ Appin, △ Bingham, and △ Polum, the last station being 25 miles south of Port Austin. In addition a number of secondary stations were located and targeted.

During the entire field season the advance of angle reading was 70 miles, and, as the station building was pushed 25 miles ahead of that, the season's work was rapid. The party disbanded November 14, the technical party returning to Detroit office.

Surveys of Lake Michigan harbors.—At the beginning of the fiscal year the party under Junior Engineer A. D. Hollingsworth, with steamer *No. 1*, had just resumed the survey of Grand Haven Harbor, including Spring Lake, begun in the fall of 1905; and the lower portion of Grand River was completed on August 9.

On August 10 the survey of Black Lake and the harbor of Holland was begun and by September 26 was completed. This comprised the controlling triangulation, the topography of the full lake shore and of Lake Michigan adjacent to the entrance, and soundings over the whole of Black Lake and in the Lake Michigan approach.

Survey of lower Saginaw River.—As it was advisable to get the small steamer, *No. 1*, nearer winter quarters before the fall gales set in, the survey of the lower Saginaw River was next assigned to the party.

This survey was begun October 3. It embraces the necessary triangulation as a frame for topographic and hydrographic work; shore work on both sides of the river extending from the Twenty-third street bridge to Saginaw Bay, and a mile and a half east and west of the river mouth; and soundings of the river from the bridge to its mouth. Work was completed November 19, and the party reported in Detroit for office work the following day.

As the original surveys on which the chart of Saginaw River was constructed were made in 1856, and no subsequent survey of any scope had been made since, the work accomplished is well worth the time devoted to it.

Surveys in vicinity of Isle Royal, Lake Superior.—The party on the steamer *Surveyor*, under Junior Engineer W. J. Graves, was on the way to Isle Royal at the beginning of the fiscal year, stopping at Marquette to inspect the water gauge and making a survey of the new ore docks.

Washington Harbor, Isle Royal, was reached on July 7 and active survey operations immediately begun. A reconnaissance of the south shore and the east and west ends of the island was made, and a survey of Tobin Harbor executed.

A frame work of triangulation, based on the secondary work of 1869, was executed to control surveys at the west end of the island. By September 10 the party had finished the shore-line topography contiguous to Grace and Washington harbors, had made soundings throughout the harbor areas and their approaches, in the vicinity of Rock of Ages, and in the intermediate stretch between. It was not found necessary to execute soundings in great detail, as the clearness of the water in this region assists the work.

Survey of Eagle Harbor, Lake Superior.—As the edition of the black-and-white chart of Eagle Harbor, based on survey of 1855, was nearly exhausted, and it was purposed to issue a new chart in colors, it seemed desirable to make a resurvey to modernize the chart. The party on the *Surveyor* reached Eagle Harbor September 14, and completed topographic surveys of the environs and hydrographic surveys of the harbor and approaches on the 18th.

Examination of ledge south of Gull Rock, Lake Superior.—On September 18 the *Surveyor* made an examination of a rock ledge, discovered by this party in 1905, and located a rock pinnacle covered by 24 feet of water. This rock, almost directly on the sailing course, is a dangerous menace to deep-draft boats during heavy seas, and its detection is noteworthy.

Survey of Munising Harbor, Lake Superior.—The season of the year having arrived when soundings in exposed places are not economical on account of wind and sea, the party on the *Surveyor* was assigned to the survey of Munising Harbor and its approaches, including shore-line work in the vicinity. This work was begun September 21. Observations were made for the true north, and the necessary fundamental triangulation executed. The work was connected with △ Grand Island of the 1872 primary work, by stadia traverse. Topography was taken of Munising village, showing docks and shore line in vicinity, and on west side of Grand Island. Soundings were made of the Munising water front, and an examination made of the east and west narrow passes in the vicinities of Sand Point and Williams Landing. Surveys were completed November 10, and on the 20th the party reported for office work in Detroit.

Magnetic work on Lake Superior.—Lake Superior having magnetic peculiarities which concern the mariner's compass, Assistant Engineer Thomas Russell set out on August 18 to investigate these conditions. Using a gasoline launch and starting from Sault Ste. Marie, he visited islands and rocks far from the shore, so as to get close to vessel tracks, and made observations for the true north and the north shown by the magnetic needle. He observed also for the magnetic dip and intensity, as bearing on the magnetic laws needed. Observations were taken on 40 stations in Lake Superior, from the east end of the lake to the International boundary at Pigeon River. The work was completed and Mr. Russell reported for office work on November 3.

Office work.—During the winter season the large amount of survey work and gauge records accumulated was reduced. A report was prepared on Magnetics of the Great Lakes by Assistant Engineer Thomas Russell. The preparation of a general project has received careful study.

Steamers.—During the year the hull of steamer *No. 2* has been rebuilt from the keel up, in the Survey yard at Fort Wayne by day labor, under plans and supervision of Junior Engineer F. F. Bontecou. This work was completed, except in some details of the upper work and the interior finish.

The small pipes which form the heating surface of the water-tube boiler of the *Search* were entirely renewed.

Some small repairs were made on steamer *No. 1.*

The *Surveyor* is not in commission, because of needed repairs and reduced appropriation.

Assistants.—During the year, or portions of it, the following technical assistants have been engaged in the work of the Survey:

Assistant Engineers F. G. Ray and Thomas Russell.

Junior Engineers W. J. Graves, Andrew J. Swift, H. F. Johnson, M. S. MacDiarmid, A. D. Hollingsworth, Sherman Moore, Ira C. Sunderland, K. B. Turner, Wellington Roberts, E. C. Hrabak, F. F. Bontecou, W. H. Vandeburgh, H. G. Merrick, Otto S. Zelner, Sidney T. Harding, and W. S. Richmond.

Recorders Fred Lockwood, D. G. MacDonald, A. E. Yokom, E. O. Mann, Isaac De Pagter, L. G. Palmer, W. J. Murphy, C. C. Van Valkenburgh, jr., and M. B. Lawton.

Of these 28 assistants, but 11 remain in the service of the Survey, owing to reduced appropriations, resignations, and transfers.

The cordial acknowledgment of good work accomplished is due to all of these assistants.

Owing to the prolonged cold and unfavorable weather, the field parties were somewhat later than usual in opening the work of the season of 1907. Three parties are now in the field, as follows:

Junior Engineer Andrew J. Swift is in charge of a party upon the Lake Survey steamer *General Williams*, engaged in sounding and sweeping east of Colchester light in the west end of Lake Erie, the object being to increase the water area bordering the usual vessel track, known beyond all question to be safe and free from dangerous shoals or obstructions.

Assistant Engineer F. G. Ray, with his party upon the steamer *Search*, is making a very minute examination by means of sweeping, to the northward of Thunder Bay Island, Lake Huron, where a shoal not previously definitely located has often been reported. A shoal has been discovered with 22 feet at standard low water, and an uncharted and very dangerous wreck has been found. These discoveries, so close to the vessel track, more than compensate for any trouble and expense consequent upon the work in this vicinity.

The third party, under Junior Engineer M. S. MacDiarmid, has completed the survey of South Haven Harbor, Michigan, and at the close of the fiscal year had begun the survey of St. Joseph Harbor, Michigan.

During June a rapid survey of the upper Detroit River was finished by Assistant Engineer Thomas Russell.

A more detailed account of the operations of these parties is contained in the following extract from the report of Principal Assistant Engineer Francis C. Shenehon, whose energy and devotion to the work have led to many economical and valuable results, the introduction of the horizontal wire sweep being a recent case in point:

In preparation for the field season of 1907, the work of fitting out the steamers *Search* and *General Williams* began in April, and of the *No. 1* in May.

Survey of the west end of Lake Erie.—To the steamer *General Williams*, under Junior Engineer Andrew J. Swift, was assigned the continuation of the careful examination of that portion of the steamer track of the deep draft vessels lying to the south of the area surveyed in 1904. The party left Detroit on May 15. Examinations of the positions of the wrecks of the *Armenia* and the *Packard* were made, a number of areas in which the soundings of 1904 indicated the

possibility of pinnacles were swept with the horizontal tension wire sweep. A search was made for a shoal reported east of Southeast shoal. On May 24 the Grubb Reef gas buoy was found to be 1¾ miles north 10° west of its proper position. The false position in which it was set, in the absence of other guides, would have directed vessels against this dangerous reef. Through the timely warning of the *General Williams* this danger was wired over the lakes and disaster averted. The party marked the proper location of the buoy and gave notice of its reinstatement.

Meanwhile the triangulation stations built in 1903 were examined and repaired where necessary, sextant signal buoys were set out, and soundings made from Pelee Island light-house westward to abreast of Hen Island, covering an area of about 25 square miles. To the westward of this some sweeping was done, and a 24-foot spot discovered north of Hen Island.

Survey of shoal area north of Thunder Bay Island, Lake Huron.—The *Search*, with a party under Assistant Engineer F. G. Ray, left Detroit on May 15, proceeding to Alpena. During the remainder of the month the necessary triangulation was accomplished, including the erection of a 56-foot station at Potters Point; buoys were set out, and sounding and sweeping begun on an area about 5 miles north of Thunder Bay Island and directly on the main track of the heavy tonnage bound from the Straits or St. Marys River through St. Clair River. Vessels having reported striking in this vicinity an examination was urgent.

By the end of June Mr. Ray had completed the sweeping and sounding of about 19 square miles, using a horizontal tension wire sweep 1,200 feet long. The examination was rewarded by the discovery of a wreck with 19½ feet of water over it, lying about three-fourths mile to the westward of the sailing course, and a rock mound, lying 2½ miles to the eastward, showing 25 feet, both at present high stage of Lake Huron. At standard low water these depths would be respectively 16½ and 22 feet, and both in their exposed positions are dangerous menaces to the lake carriers. It is understood that orders have been issued for the removal of the wreck by dynamiting. In addition to the water area surveyed, some local topography was taken by this party on stormy days.

Survey of Lake Michigan Harbors.—Steamer *No. 1* left Detroit on May 23 with a party under the direction of Junior Engineer M. S. MacDiarmid to continue harbor surveys. On the way to Lake Michgan the water gauge at St. Clair Flats Canal, the two at Port Huron, and the Harbor Beach gauge, were inspected, and levels run to check the zeros of staff gauges.

South Haven was reached June 2 and the harbor survey energetically begun. The survey includes the local topography for a mile each side of the harbor entrance and as far inland, as well as soundings in the river and lake approaches. Control was established by stadia traverse. An observation for north was made. The use of the plane table means that on June 26, when the party left for St. Joseph, not only the survey was accomplished, but the sheet was nearly ready for transmission to the office for incorporation in the chart work.

At the close of the year the survey of Benton Harbor and St. Joseph is well started.

Survey of a portion of Detroit River.—During June Assistant Engineer Thomas Russell made a rapid survey of the shore features of the north channel of Detroit River from Belle Isle Bridge to Windmill Point, to modernize the forthcoming new edition of the river chart.

On July 30, 1906, the Survey lost by resignation consequent upon taking up duties of importance elsewhere Principal Assistant Engineer E. E. Haskell, who has been identified with the Survey since its more active resumption in 1893. Mr. Haskell has left upon the Survey the deep impress of his high character and ability.

Bulletins.—The bulletins of the survey of the Northern and Northwestern Lakes contain important data and information supplementary to the charts, but of too voluminous a character to be incorporated thereon, and they are accordingly issued free in connection with the charts. Bulletin No. 12, of 1902, and those preceding it, were printed in Washington, but on July 10, 1902, the entire work of printing and issuing bulletins and supplements thereto was turned

over to this office. The work of printing is now performed under contract.

The numbers published during the year are as follows:

Supplement No. 3 to Bulletin No. 16, July 16, 1906.
Supplement No. 4 to Bulletin No. 16, August 21, 1906.
Supplement No. 5 to Bulletin No. 16, September 20, 1906.
Supplement No. 6 to Bulletin No. 16, October 18, 1906.
Supplement No. 7 to Bulletin No. 16, November 19, 1906.
Supplement No. 8 to Bulletin No. 16, December 19, 1906.
Bulletin No. 17, April, 1907.
Supplement No. 1 to Bulletin No. 17, May 27, 1907.
Supplement No. 2 to Bulletin No. 17, June 20, 1907.

Supplements Nos. 3, 4, 5, 6, 7, and 8 to Bulletin No. 16 covered all reported changes of interest to navigators arising between July 1 and December 31, 1906. In pursuance of the policy previously inaugurated of inserting in the bulletins and supplements, as occasion arises, small maps showing locations of new shoals, changes in important channels, harbors not otherwise charted, etc., Supplement No. 5 contained an inset chart of the new west channel at St. Clair Flats Canal, which was opened to navigation September 3, 1906.

Bulletin No. 17, thoroughly revised and giving the latest information obtainable as to channels, harbors, and matters of interest to navigators over the entire lakes and connecting waters, was mailed the first part of May, 1907. In addition to its extensive descriptive matter, the bulletin contained inset maps as follows: Magnetic chart of the Northern and Northwestern Lakes; magnetic variations in west end of Lake Superior; vicinity of Sister Bay and Eagle Harbor, Green Bay; Nahma, Mich., Big Bay de Noc, Green Bay; Rogers, Mich., Lake Huron; one of St. Clair Flats Canal and one of lower Detroit River, showing conditions at opening of navigation, 1907. The catalogue of charts, with index chart of Northern and Northwestern Lakes, was revised to date and also included. Supplements Nos. 1 and 2 to this bulletin, issued prior to the close of the fiscal year, covered all changes received to June 18. Supplement No. 1 contained an inset of Limekiln Crossing, lower Detroit River, showing a change in arrangement of the channels at that critical point.

The present circulation of these publications numbers 2,500 copies annually, extending to a large proportion of the important interests engaged in the navigation of the lakes, as well as to various commercial and industrial concerns and individuals whose interests are related in some measure with lake improvement.

Water levels.—The stage of water in the lakes and in the interlake and outflow rivers has been recorded as heretofore by the regular series of self-registering water gauges, with the changes noted. The gauge at Charlotte, Lake Ontario, was demolished during the gale of October 10, 1906, being rammed by a schooner which broke loose from its moorings. This gauge was not replaced, but staff-gauge readings were continued during the year. A self-registering gauge at the head of the St. Clair Flats Canal was installed October 4, 1906. This was maintained by the U. S. Engineer Office under Col. Chas. E. L. B. Davis, Corps of Engineers, during the season of navigation, and by this office during the winter season.

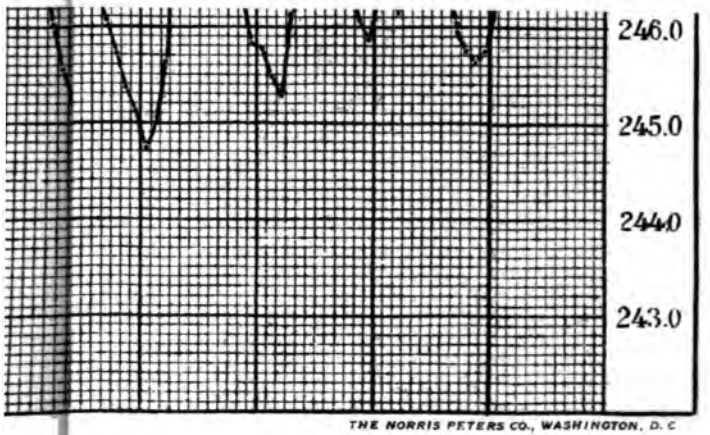
1
1
1
1

g
A
th
gi
fu
T
M

M
Mi
Ha
Cl
Ch

of
siv

tu



THE NORRIS PETERS CO., WASHINGTON, D. C

On the Niagara River, in connection with the effect upon the navi-ıble integrity of that river and Lake Erie and the preservation of iagara Falls, slope observations and soundings were made, current nes were established, and the flow over the American Falls roughly easured. In addition a series of photographs was taken connecting ıe volume of flow and the appearance of the cataracts and rapids. his work was the subject of a special report dated January 30, 1907, ıd will be touched upon under the next heading.

The following table gives a summary of discharges, as so far de-ırmined, corresponding to the mean elevations of the various lakes ›r the last forty-seven years:

Table of mean discharges.

›an elevation for 47 years (1860-1906) above mean tide at New York City.		Corresponding mean discharge in cubic feet per second.	
Lake.	Stage.	River.	Discharge.
›erior	602.31	St. Marys	77,000
ron-Michigan	581.33	St. Clair	[a] 205,000
Clair	575.75	Detroit	210,000
e	572.60	Niagara	[b] 215,000
tario	246.18	St. Lawrence	255,000

Does not include amount passing through Chicago Drainage Canal.
Includes 1,200 cubic feet passing out through Erie Canal and 1,100 cubic feet through Welland ıal.

Preservation of Niagara Falls.—Under an allotment of $5,000 made pril 27, 1907, from the appropriation for preservation of Niagara ılls, act of June 29, 1906, observations and measurements for the termination of the effect upon the American Falls of present and oposed power diversions near the Falls, have been in progress—a ırty under Junior Engineer Sherman Moore being engaged upon e work. Automatic water gauges have been established at critical ints, float measurements taken, a section selected for current work the American approach; and the general progress has been as scribed in the following extract from the report of Principal ssistant Engineer F. C. Shenehon, which includes certain work in 06 and prior to May, 1907, carried on in connection with the chart ırveys of the region about Niagara Falls:

The initiation of this work was under my own direct supervision and was ırried on jointly with the chart surveys of the region about Niagara Falls om Echota to Lake Ontario.

Self-registering water gauges were set at Black Creek, Chippawa, and in the hirlpool on the Canadian side, and at Suspension Bridge and Lewiston on the merican side. Later in the season additional gauges were set close to the rest lines of the American and Horse Shoe Falls, and a third near the head of ıe American channel. These gauges showed the relative fluctuations of water ırface for known increments of river flow. They were connected with per-ıanent bench-marks by levels and frequently checked.

The crest lines of the two cataracts were redetermined by transit intersec-ons, to measure the upstream recession of the Falls, and the land encroach-ents on the Horseshoe Fall.

The approach to the American Rapids was sounded where safe to do so with ıles, and below the "dead line" by floats with submerged stems of fixed ngths. The floats, read in by transit intersections, gave also the current lines ıd velocities, and in connection with the depths show the approximate volume flow over the American Fall.

The current lines show, in the river above, the source of supply for the power canals and for the American Falls, and demark the line of dividing water at the head of Goat Island.

On August 14, 1906, my recall to Detroit to assume the duties of Principal Assistant Engineer left the immediate supervision of the work in the hands of Junior Engineer Andrew J. Swift. Subsequent work included the water profiles along the main shore, on both the Canadian and American sides, of the several rapids, and the determinations of the crest lines of the minor cascades above the cataracts.

On November 21 the party began a series of photographs, taken from fixed stations, to show the appearance of the cataracts and the rapids above them under widely varying volumes of flow. To this end photographs were secured during westerly gales that raised Lake Erie at Buffalo and created heavy river flow, and in contrast, when easterly gales had crowded the water into the west end of Lake Erie, leaving it low at Buffalo with light volumes of discharge. The river gauges were calibrated to show discharge, and the photographs were labeled to show the volume of river flow at the time of taking. The photographic work was done by Mr. Oscar Hagenjos, one of our own permanent employees, and the series is a valuable collection of evidence of the scenic changes coming with known changes of volume. These photographs were submitted to the Chief of Engineers, United States Army, in a report dated January 30, 1907.

The fieldwork at the Falls was discontinued December 17, 1906, the party returning to Detroit, where during the winter the work was fully reduced.

Under the allotment from the Burton Act, made April 27, 1907, preparatory office work was begun May 1, and a party under Junior Engineer Sherman Moore (who had assisted in part of the work of 1906 and in the office reductions) left for Niagara Falls on May 20, this year, to extend the work, and in addition to measure the flow over the American Fall, in the hydraulic canal, in the power canal, and to make some further measurements of the total river flow at the International Bridge, Buffalo. By the end of the fiscal year self-registering water gauges had been established at the foot of Austin street, Black Rock, at Chippewa, at the entrance of the power canal, Niagara Falls, at Suspension Bridge, and in the Whirlpool; occupying the positions of former gauges. In addition, a number of staff gauges were established.

Soundings to show the hydraulic conditions, as affected by the formation of the bottom, were made in the approach to the Horseshoe Rapids, and some additional soundings made above the American Falls. The same methods—pole soundings above the "dead line" and float work below—were used, although some venturesome expeditions in perilous places made exceptions to this rule. This work, at the best dangerous, was completed without accident.

Additional work was done on the water contours of the rapids, having in view the possible construction of a model to illustrate why water abstractions by certain companies may produce only localized effects. The work at the Falls is well under way and promises valuable returns.

During the past fiscal year the operations of the Survey and the maintenance of its equipment have been hampered by a considerable reduction in the appropriation made for it by Congress.

Having in view the earliest possible completion of fieldwork and the most advantageous use of already acquired plant and equipment, an expenditure of at least $115,000 during the year ending June 30, 1909, will be necessary for such reasonable progress as the circumstances of the case require, and for continuing the investigation of lake levels not less than $10,000 should be provided.

I therefore recommend and, so far as permissible, urge that the appropriation for the year 1909 be made to cover the two amounts above indicated, as follows:

For survey of Northern and Northwestern Lakes, including all necessary expenses for preparing, correcting, extending, printing, and issuing charts and bulletins, and of investigating lake levels with a view to their regulation, to be immediately available and to remain available until expended, $125,000.

Dates and amounts of appropriations for surveys of Northern and Northwestern Lakes.

March 3, 1841	$15,000	March 2, 1868	$77,500
March 18, 1842	20,000	July 20, 1868	75,000
March 1, 1843	30,000	March 3, 1869	100,000
June 17, 1844	20,000	July 15, 1870	100,000
March 3, 1845	20,000	March 3, 1871	175,000
August 8, 1846	25,000	June 10, 1872	175,000
August 12, 1848	25,000	March 3, 1873	175,000
March 3, 1849	10,000	June 23, 1874	175,000
September 28, 1850	25,000	March 3, 1875	150,000
March 3, 1851	25,000	July 31, 1876 (not including $16,000 applied to survey of Mississippi River	84,000
August 30, 1852	25,000	March 3, 1877 not including $25,000 applied to survey of Mississippi River and including $9,500 received from sale o steamers	94,500
March 3, 1853	50,000	June 20, 1878 (not including $49,500 applied to survey of Mississippi River)	49,500
August 5, 1854	50,000	March 3, 1879	85,000
March 3, 1855	50,000	June 16, 1880	40,000
August 30, 1856	50,000	March 3, 1881	18,000
March 3, 1857	50,000	August 7, 1882	12,000
June 12, 1858	75,000		
March 3, 1859	75,000	Total	2,939,879
June 21, 1860	75,000		
March 2, 1861	75,000		
July 5, 1862	105,000		
February 9, 1863	106,879		
July 2, 1864	100,000		
February 28, 1865	125,000		
June 12, 1866	50,000		
March 2, 1867	77,500		

Printing and issue of charts for use of navigators and electrotyping copperplates for chart printing.

March 3, 1883	$3,000	March 3, 1893	$2,000
July 7, 1884	3,000	August 18, 1894	2,000
March 3, 1885	3,000	March 2, 1895	2,000
August 4, 1886	2,000	June 11, 1896	2,000
March 3, 1887	2,000	June 4, 1897	2,000
October 2, 1888	2,000	July 1, 1898	3,000
March 2, 1889	2,000	March 3, 1899	3,000
August 30, 1890	2,000	June 6, 1900	3,000
March 3, 1891	2,000		
August 5, 1892	2,000	Total	42,000

Surveys and additions to and correcting engraved plates.

March 2, 1889	$5,000	June 11, 1896	$25,000
August 30, 1890	10,000	June 4, 1897	25,000
March 3, 1891	10,000	July 1, 1898	25,000
August 5, 1892	5,000	March 3, 1899	25,000
March 3, 1893	25,000	June 6, 1900	75,000
August 18, 1894	25,000		
March 2, 1895	25,000	Total	280,000

Surveys, including investigations of lake levels, correcting, printing, and issuing charts and bulletins.

March 3, 1901	$100,000	June 30, 1906	$75,000
June 28, 1902	150,000	March 4, 1907	75,000
March 3, 1903	150,000		
April 28, 1904	150,000	Total	800,000
March 3, 1905	100,000		

Money statement.

SURVEY OF NORTHERN AND NORTHWESTERN LAKES.

1906.			
July 1,	Balance unexpended		$130,081.02
	Taken up on books. (Item of Sept. 19, 1902, which should have been charged to the limited appropriation "Survey of northern and northwestern lakes, 1901	[a] $31.62	
July 7.	Deposit of proceeds, sale of old boiler	150.00	
Sept. 4.	Deposited to credit of, by Lieut. Col. George McC. Derby, Corps of Engineers	238.97	
Oct. 9.	Deposited to credit of, overpayments on vouchers 59, 60, 61, 62, and 63, August; and vouchers 51, 52, 53, 54, and 55, September accounts, 1906	1.30	
1907.			
Apr. 23.	Allotted from act approved June 6, 1900	1,200.00	
	Allotted from act approved June 28, 1902	300.00	
	Allotted from act approved March 3, 1905	3,956.45	
	Allotted from act approved June 30, 1906	1.28	
	Allotted from act approved March 4, 1907	74,000.00	
May 20.	Deposited to credit of, by Col. Charles E. L. B. Davis, Corps of Engineers	40.00	
June 25.	Deposited to credit of, by Capt. W. J. Barden, Corps of Engineers	171.36	
			80,090.98
			210,172.00
June 30.	Amount withdrawn during fiscal year	.84	
	Amount expended during fiscal year	136,542.83	
			136,543.67
	Balance unexpended		73,628.33
	Outstanding liabilities		8,840.09
	Balance available		64,788.24

PRESERVATION OF NIAGARA FALLS.

1907.		
Apr. 27.	Allotted from act approved June 29, 1906	$5,000.00
June 30.	Amount expended during fiscal year	457.66
	Balance unexpended	4,542.34
	Outstanding liabilities	685.98
	Balance available	3,856.36

[a] The statement of balances unexpended and balances available in the Annual Reports of the Chief of Engineers for 1903, page 2680; for 1904, page 4059; for 1905, page 2783 (corresponding statement not published in 1906), should be increased $31.62.

APPENDIX J J J.

IMPROVEMENT OF YELLOWSTONE NATIONAL PARK, INCLUDING THE CONSTRUCTION, REPAIR, AND MAINTENANCE OF ROADS AND BRIDGES.

REPORT OF FIRST LIEUT. E. D. PEEK, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

UNITED STATES ENGINEER OFFICE,
Yellowstone Park, Wyo., July 1, 1907.

GENERAL: I have the honor to forward herewith my annual report for the fiscal year ending June 30, 1907, for the improvement of Yellowstone National Park.

Very respectfully, your obedient servant,

E. D. PEEK,
First Lieut., Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

The work during the last fiscal year, ending June 30, 1907, was executed under the appropriation of June 30, 1906, and March 4, 1907.

Practically no new work was done during the year, as the project adopted May 29, 1902, was practically completed. All roads in the original project have been thrown open to travel. The work for the year consisted in maintenance and repair of the roads and bridges already built.

GARDINER ENTRANCE.

The trees, shrubs, vines, and lawns about the entrance were maintained throughout the tourist season, and with the advent of winter were protected from the severe weather when necessary.

THE ALFALFA FIELD.

The alfalfa field of about 50 acres near Gardiner was irrigated, the crops cut for the Interior Department, and fed during the winter to the game. The quantity of hay secured was considerably more than the year previous. Bands of elk and antelope numbering from 400 to 500 visited the field throughout the winter.

As the alfalfa is raised for the use of the Interior Department, and as all improvements necessary for irrigation have been made, the maintenance and care of the field was taken up in the spring of 1907 by the superintendent of the park.

MAMMOTH HOT SPRINGS.

The maintenance of lawns and shrubbery was continued throughout the summer, and all trees and shrubs liable to winter kill or to injury by game or stray stock were protected by suitable tree guards and movable wire fences.

The large rectangular plot of ground in front of the United States Engineer Office was covered with black soil. Upward of 1,000 loads were hauled and thoroughly rolled. This has been seeded and has at present a good crop of grass. The small plots of ground to the left on coming onto the flat at Mammoth Hot Springs from Gardiner, and the plot between the Cottage Hotel and post-office, were leveled, fertilized, plowed, and seeded. An iron fountain was placed in the large irrigating basin in front of the residence of the United States commissioner. These improvements have added materially to the work already done at Mammoth Hot Springs. The ground in the vicinity of Hymen Terrace in the Chinaman's Gulch was leveled and cleared of rock, in order that tourists could drive into the gulch and view the terrace, which, though small, is one of the most beautiful in the park. A neat fence has been built surrounding it. The posts of iron are painted white, in order to harmonize with a dull white background, and these are connected by heavy wire.

PLANT.

All sprinkling wagons, road graders, carts, and other vehicles were inspected and the necessary repairs made. The machinery, tools, etc., in use during the season of 1906 were overhauled and put in a thorough state of repair after being returned to stores. A small portable planer was purchased, taken to the site of the portable sawmill, and considerable lumber dressed. This machine has proved very valuable, as by its use dressed lumber is now available at a central point in the park, with a saving in hauling of from 30 to 70 miles.

SPRINKLING.

Approximately 100 miles of road were sprinkled during the past season. Two methods are used in filling sprinkler tanks—pumping and gravity. As experience has shown that it is almost impossible to get sufficient water on the roads where pumping is necessary, the system of converting pumping stations into gravity tanks, or overshots, has been vigorously pushed. Hydraulic rams have been installed in many places where water was not available before, thus obviating the necessity of hauling water to such points and also of passing over ground already sprinkled. Where a run is supplied from pumping stations alone, it is difficult to sprinkle satisfactorily more than 4 miles per day, and this is a high average. With overshot

tanks it is very easy to sprinkle at least 7 miles. In each case the road is sprinkled twice a day.

A project for sprinkling the 4 miles of road over the divide between the Firehole and Gibbon rivers was prepared, and the necessary surveys made. The cost of installing the plant with the present small appropriation was thought to be too great, and the work was not undertaken. The cost would have been approximately $6,500, and if the money was available it would be deemed advisable to expend this amount, as this section is very sandy and dusty. It is always a good road and rather hard during wet weather, so that sprinkling should give very good results.

BRIDGES AND CULVERTS.

A new wooden abutment was built at the bridge over the Firehole River on the Fountain-Upper Basin road.

New decking was laid on the bridge 2 miles from the Thumb on the Upper Basin road; also on the bridge one-half mile from Norris on the Canyon road, and on the East Gardiner Bridge on the Mammoth Hot Springs-Tower Falls route. New railings were placed on the bridge at Canyon Junction. Minor repairs were made on many of the other wooden bridges.

The bridge across Sulphur Creek was replaced by a fill 100 feet long and 14 feet deep. An iron culvert 3 feet in diameter was laid to carry the water.

A bridge 20 feet long, 2½ miles from the Canyon on the Lake road, was replaced by a culvert and the necessary fill made.

Tile culverts were laid at 1½ miles on the Gardiner-Springs road, at 10½ miles on the Springs-Norris, at 7⅞ miles on the Norris-Fountain, at 6¾ miles on the Upper Basin-Thumb, and in addition thereto a small bridge was put in at 9½ miles on the same road. Three culverts were also laid on the Canyon-Inspiration Point road.

CLEARING OF TIMBER.

The roads throughout the park pass through a mass of dead and fallen timber, which makes the roadside very unsightly. As an experiment, this timber was cleared away and burned in certain sections, including the ground adjacent to the road from Gardiner to Mammoth Hot Springs; the formation and all points of interest at Mammoth Hot Springs; from Nez Perce Creek to Fountain Hotel and 1½ miles beyond; from Riverside Geyser for 1½ miles to the Upper Basin Hotel; between the road and the lake for 2½ miles on the road from the Thumb to the Lake; and for 2 miles on both sides of the road from the Lake Hotel toward the Canyon. Along the Yellowstone River, for 2½ miles before coming into Canyon Station, a great mass of timber embedded in the stream, which had been gathering green scum and slime for years and giving off very offensive odor late in the season, was pulled out of the water and burned. The labor and disagreeable work required were amply repaid by the marked improvement in appearance.

PETRIFIED TREES.

A road about three-fourths of a mile in length was built to the petrified tree stumps near Yancey's.

The hillside surrounding one of the stumps was blasted out and the trunk of the tree as now seen is 30 feet high and 21 feet in circumference. The solid rock in which the trunk was embedded, surrounding and in close contact with it, had to be blasted before it could be removed.

On account of the acts of vandalism committed by many people, it has been deemed advisable to inclose this trunk in a fence. A neat iron picket fence with suitable gates for entry has been purchased and will be erected shortly.

SURVEYS.

A survey was made for a road to connect the Canyon and Tower Falls. This line was to be a low level line and seems to be a project worthy of considerable attention because the route via Mount Washburn is open only after July 15.

The act of March 4, 1907, appropriated $1,000 for a survey from the point where the Gallatin River crosses the west boundary to a point about 7 miles from Mammoth Hot Springs on the Norris road.

This survey was begun on June 8 and work has been pushed vigorously since that date, but on account of the great amount of snow in Big Horn Pass and for a few miles on each side, it has been delayed somewhat and will not be completed until about the middle of July.

PLATFORMS AND OUTHOUSES.

The ladder going into the Devil's Kitchen at Mammoth Hot Springs was removed and a flight of stairs leading to the bottom of the Kitchen was installed in place of it.

At Apollinaris Spring a platform 90 feet in length, to permit tourists to enter and leave the coaches, was constructed.

At Keppler Cascades two platforms 50 feet long were installed, and walks were built from these platforms to a platform 16 feet square, which forms a place for viewing the Cascades.

Two 50-foot platforms were built at Mud Geyser and also at the Upper Falls of the Yellowstone.

Along the Canyon, platforms and stairways were built at the principal points of interest, namely, two places at the Upper Falls, the Lower Falls, Grand View, Ispiration Point, and Artist Point.

Outhouses were constructed at each of the following places, Appollinaris, Norris, Gibbon River, Keppler Cascades, De Lacy Creek, Mud Geyser, and Dunraven Pass.

SIGNS.

Numerous signs of many designs and descriptions have been put up in the Park from year to year. During the past season a carefully revised list was prepared and about 600 signs purchased. They are of steel, enameled to withstand the sun and rain, and are practically indestructible. They are screwed to boards which are fastened to neat iron posts set in concrete.

CAMPS AND HOUSES FOR CREWS.

Permanent camps with floors for the tents and frames for canvas have been constructed near Obsidian Cliff and the Canyon Junction. Timber has been cut and hauled for a permanent camp to be built 6 miles from the Canyon on the Lake road and at Beryl Spring.

Three houses were built on the Divide between Upper Basin and Thumb for the snow crews in opening the roads and for the sprinkling camps and repair crews during the summer. They are incomplete as regards interior finish, windows, and chimney. The experience of this spring demonstrated that they will be of great value, for, although they are far from completion, they afforded considerable protection to the men. Two barns of slabs were built at two of the houses and sawed lumber has been hauled to the third house, for another barn which will be constructed shortly. Heretofore it has been necessary to camp on the snow in opening the roads, and, in consequence, man and horse gave poor results.

GENERAL REPAIRS.

The work consisted mainly in grading up the road, repairing such holes as were found, and hauling as much surfacing material as the funds would permit.

Considerable work was done at a washout on the Cooke City road in the vicinity of Jackson's grade. This section, about a thousand feet in length, was riprapped with large stones, and is now in a condition to withstand high water. About 3½ miles from Mammoth Hot Springs numerous bad slides occurred, and occur each year. This is a portion of the road which should be relocated to get better ground and also to avoid a long grade.

The bridge over the Gibbon at the 10-mile post on the Norris-Riverside road was raised 2 feet, and a steep hill on the far side of the stream was cut down materially. This hill was very bad and made it necessary to double teams drawing a fairly heavy load.

The West road to Riverside, together with the South and East roads, were cleared of all fallen timber and minor repairs made.

The act of March 4, 1907, provided for $10,000, to be spent in the forest reserve on the East and South roads. A crew has been at work for more than two months in the East Reserve, and has cleared all fallen timber, stones, and dirt to a point about 6 miles from Pahaska. Considerable work was done to lessen the danger from overhanging rocks. These were all removed and the road widened in narrow portions where it was dangerous to pass with large loaded wagons with wide racks.

From 6 miles below Pahaska to a point 3 miles from it the road passes through heavy timber. As there were no culverts in this section the water from freshets and small streams ran over the roadbed, and, as the soil is black loam, it became practically impassable during rainy weather save for light loads. It was in very poor condition and considerable work has been done upon it, including cutting out the timber for a width of 60 feet on the south side to admit the

direct rays of the sun, the putting in of the numerous culverts necessary, and the hauling of a large amount of gravel.

In the section of the East road in the park many culverts were replaced and several new ones laid.

The East road comes via Sylvan Pass, and on account of the great amount of snow this year will not be open till July 10.

The bridge at Elk Fork near Wapiti was nearly washed away on account of the washing out of the dirt in the abutments, which were built of logs. The abutments have been sheathed with plank on the inside and refilled with rock in order to avoid any repetition in the future.

The bridge across the Shoshone, about 3 miles from Wapiti, had sagged considerably through the drying of the timbers and the settling of the cribs. It was raised and pulled into shape.

On the South road only minor repairs have been made, but after July 15 the work will be undertaken much more extensively.

On the main belt line or circuit more work was done on account of the much heavier traffic. Surfacing was done quite extensively on the Gardiner-Mammoth Hot Springs road from 2¾ miles to 3½ and from 3⅝ to Mammoth Hot Springs; on the Norris-Fountain road from 5½ miles to 7½ and from 15 miles to the Fountain, a total distance of 7 miles; on the Divide from 6¾ to 7¾ miles from Upper Basin, together with an extended fill some 400 feet long.

On the Canyon-Norris road numerous hills were cut down and the material put in the sags. Two hills in particular, about 2½ miles from Norris, were materially improved.

The ground in the vicinity of Apollinaris Spring was cleared of all dead timber and generally policed. Walks were laid out from the spring to the platform and to the outhouses, and graveled. Subdrains were also laid, and the grounds now are greatly improved.

Similar improvements were made at Mud Geyser.

On the 5 miles of road between Gardiner and Mammoth Hot Springs much work was done. In the fall of 1906 a large dry slide came down near the first bridge from Gardiner. Sliding continued throughout the winter and a considerable amount fell this spring, more than 2,000 yards of earth coming from this portion alone. Near 1½ miles another slide occurred, filled with springs, and troublesome to handle. It was eventually removed by sluicing.

Next to the slides the most expensive work has been in keeping the road from being washed out. Large bowlders, aggregating more than 200 tons, fell in a section of the Gardiner River less than 150 feet in length, one bowlder alone weighing approximately 75 tons. This rock had to be removed in order to keep the road from being washed out. Upward of 20 breaks in the wall occurred in the vicinity of 1½ miles from Gardiner.

The wall along the river is a dry wall, and the water rushing down washes out the material behind the rocks and below the water. The result is that the road is all undermined along the wall, which always gives away during high water, when it is most difficult to repair. Large bowlders weighing 1½ tons were carried downstream as if they were toys. The only method that could be used in some cases was to chain huge bowlders to solid rock and roll them in the stream. Then is was also required to drill holes under water and to put in large

pieces of steel to keep bowlders from rolling away. In places one-half of the road was washed out in a few hours, leaving barely room for a single team to pass. On one occasion it was necessary to take all men available and work two days and a night save, for a few hours in the early morning. Too much stress can not be laid upon the fact that these dry walls must be replaced by those laid in mortar.

Minor repairs to dry walls were made near Gibbon Falls, Keppler Cascades, and at the Upper Falls of the Yellowstone.

OPENING OF THE PARK SEASON.

For several years the park hotels have opened for tourists on June 1. This year the hotels did not open till June 10, which was very fortunate on account of the great amount of snow. The first coach leaving Mammoth Hot Springs on June 10 crossed the Divide between the Upper Basin and the Thumb on June 12. The road was open for traffic on June 11. The engineer officer in charge of the park work had been advocating this change for years, and it is hoped that it will be continued in the future.

The snow this season was exceptionally deep, and snow is still three feet in places on the roadside on the Divide road between the Upper Basin and the Thumb.

Money statement.

July 1, 1906, balance unexpended	$60,615.10
Amount appropriated by sundry civil act approved March 4, 1907	75,000.00
	135,615.10
June 30, 1907, amount expended during fiscal year	78,171.51
July 1, 1907, balance unexpended	57,443.59
July 1, 1907, outstanding liabilities	17,783.41
July 1, 1907, balance available	39,660.18
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance and repairs, in addition to the balance unexpended July 1, 1907	200,000.00

ESTIMATES.

The immediate needs of the system for the next year are as follows:

General work	$147,500
Bridges	7,500
Sprinkling	30,000
Plant	15,000
Total	200,000

To one who has been in the park for more than one season it is very evident that the appropriations for the past three years are totally inadequate to maintain the present system.

Within a period of five years from 1901-5 nearly $1,000,000 was spent in constructing the present road system. This system will be in a very poor and wornout condition in another season unless imme-

diate steps are taken to maintain it more extensively than has been done during the past two years. It is demonstrated that the road material available at most points in the park is of poor quality, and, in consequence, it is found that but few miles of the road are built of good-wearing material and the system is greatly handicapped. The present method of making repairs with the nearest material available should be changed and the best surfacing obtainable should be used instead. Suitable rock is very scarce and team hire is high. At points where good rock is found a crusher should be installed, and, by means of belts, the crushed material should be carried to elevated bins similar to coal chutes on railroads. Some of the hauls must necessarily be great, as much as 30 miles or more, and a 25 or 30 horsepower traction engine, capable of pulling 35 tons or more up any grade in the park, should be purchased, together with cars specially constructed to hold upwards of seven tons of rock. It will take four or five years to haul sufficient crushed rock for the entire system, but when once done it will last. The past month, with rain three days in four, has been very trying on roads subjected to such heavy travel, and several thousand dollars were spent practically in keeping water from standing in pools on the roadbed. This expenditure would be eliminated if the road were macadamized. It is out of the question to consider the proposition of doing this with teams. The only feasible method is by means of a traction engine, which will do away with some 35 teams and 35 drivers and require only four or five men with engine and cars.

In the item of $15,000 for plant it is contemplated to purchase one engine to cost $3,000; five cars at $500 each, a total of $2,500; one rock crusher, $2,500; one belt conveyer, $500, and minor tools and appliances to carry on the work.

As stated previously in this report under heading of general repairs the subject of replacing the dry retaining walls with rock walls laid in mortar or built entirely of concrete must be undertaken immediately. So many slides and breaks in dry walls have occurred that it is only a matter of great fortune that the road from Gardiner to Mammoth Hot Springs has been saved several times from going out entirely.

I am firmly of the opinion that if the water in the Gardiner River is as high next summer as it has been this season, that some day the road will be so washed out as to require using the old road from Gardiner to Mammoth Hot Springs, which runs over the hills and which has not been used for twelve years or more.

Under the item "Bridges, $7,500," it is proposed to purchase steel bridges for the following, viz:

	Feet long.
Gibbon River, Norris-Fountain road, 5 miles	105
Gibbon River, Norris-Fountain road, 6⅞ miles	80
Herron Creek, Thumb-Upper Basin road, 9¾ miles	95

It is very urgent that these bridges be installed, as the present wooden structures are about worn-out, and they should be replaced with steel bridges and concrete abutments.

The sum appropriated for the entire work in the park should be granted as a whole, under the general head of maintenance and repair, and not divided, as the conditions are such that it might be *detrimental* to the interests of the park.

APPROPRIATIONS.

Act.	Administration and protection.	Roads and bridges.	Total.
March 3, 1883	$16,429.97	$23,570.03	$40,000.00
July 7, 1884	16,999.98	23,000.02	40,000.00
March 3, 1885	16,790.63	23,209.37	40,000.00
July 15, 1886	934.25	.....	934.25
August 4, 1886	.....	20,000.00	20,000.00
March 3, 1887	.....	20,000.00	20,000.00
October 2, 1888	.....	25,000.00	25,000.00
March 2, 1889	.....	50,000.00	50,000.00
August 30, 1890	.....	75,000.00	75,000.00
March 3, 1891	.....	75,000.00	75,000.00
August 5, 1892	.....	45,000.00	45,000.00
March 3, 1893	.....	30,000.00	30,000.00
August 18, 1894	.....	89,434.76	30,000.00
March 2, 1895	10,565.24		30,000.00
June 8, 1896	.....		5,000.00
June 11, 1896	.....		35,000.00
June 4, 1897	6,736.74	28,263.26	35,000.00
July 7, 1898	11,356.57	28,643.43	40,000.00
March 3, 1899	5,534.64	34,465.36	40,000.00
June 6, 1900	5,000.00	55,000.00	60,000.00
March 3, 1901	5,000.00	113,000.00	118,000.00
June 28, 1902	5,000.00	250,000.00	255,000.00
March 3, 1903	5,000.00	250,000.00	255,000.00
April 28, 1904	7,500.00	250,000.00	257,500.00
March 3, 1905	7,500.00	133,000.00	140,500.00
June 30, 1906	7,500.00	55,000.00	62,500.00
March 4, 1907	8,000.00	75,000.00	83,000.00
Total	135,848.02	1,771,586.23	1,907,434.25
Received from other sources (see money statement, 1903, p. 2892)	.....	210.00	210.00
Received from other sources (see money statement, 1904, p. 4178)	.....	117.80	117.80
Received from other sources (see money statement, 1905, p. 2812)	.....	523.15	523.15
	135,848.02	1,772,437.18	1,908,285.20
Less amount reverted to Treasury, July, 1904, appropriation 1901-2	.....	621.22	621.22
Grand total	135,848.02	1,771,815.96	1,907,663.98

APPENDIX K K K.

ROAD INTO MOUNT RAINIER NATIONAL PARK.

UNITED STATES ENGINEER OFFICE,
Seattle, Wash., July 2, 1907.

GENERAL: I have the honor to forward herewith annual report on road into Mount Rainier National Park for the fiscal year ending June 30, 1907.

Very respectfully, your obedient servant,

H. M. CHITTENDEN,
Major, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

ROAD INTO MOUNT RAINIER NATIONAL PARK.

Notification of annulment of contract with A. D. Miller for construction of road was received at this office on July 8, 1906, and work was commenced with hired labor and Government plant July 9. Operations during the season of 1906 were carried on below Longmire Springs, and 6 miles of road built and about 1½ miles partly built between the western boundary of the Forest Reserve and Longmire Springs. Work was carried on until November 20, 1906, when it was suspended on account of unfavorable weather.

Work was resumed on April 9, 1907, and the uncompleted road below Longmire Springs was practically finished.

At the end of the year part of the force had been moved to a camp above Longmire Springs.

The number of tourists that visited the park during the fiscal year 1906 was 1,786, more than double the number for the preceding year.

The work was in charge of Assistant Engineer Eugene Ricksecker, who has taken great interest, not only in the construction of the road, but in all matters pertaining to the welfare of the reservation.

Money statement.

July 1, 1906, balance unexpended	$63,404.74
Amount appropriated by sundry civil act approved March 4, 1907	50,000.00
	113,404.74
June 30, 1907, amount expended during fiscal year, for works of improvement	56,324.60
July 1, 1907, balance unexpended	57,080.14
July 1, 1907, outstanding liabilities	10,900.00
July 1, 1907, balance available	46,180.14
Amount (estimated) required for completion of existing project	75,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1909, for works of improvement, in addition to the balance unexpended July 1, 1907	50,000.00

APPENDIX L L L.

OPERATIONS ON BUILDINGS, ARMY WAR COLLEGE, WASHINGTON, D. C., AND ENGINEER SCHOOL, WASHINGTON, D. C.

REPORT OF CAPT. JOHN S. SEWELL, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

UNITED STATES ENGINEER OFFICE FOR
RECONSTRUCTION OF WASHINGTON BARRACKS,
Washington Barracks, Washington, D. C., July 1, 1907.

GENERAL: I have the honor to submit herewith my annual report for the year of 1907, on work under my charge at Washington Barracks, D. C.

WAR COLLEGE.

This work is entirely finished and the accounts all settled up. For detailed history of this work reference is made to the Annual Reports of the Chief of Engineers for the years 1902, 1903, 1904, 1905, and 1906.

The War College building, apart from its terrace and the work on the grounds, has been completed at a cost of about 28 cents per cubic foot. For a building of this type, with its difficult foundations, rising markets, and other adverse conditions under which it was erected, this is considered a very reasonable figure; it could hardly be duplicated at the present time for less than 32 or 33 cents.

In connection with the War College building, there are two points which should receive attention. The pavement of the rotunda was desired by the architects to be of brick, laid on edge, with some Joliet stone trimmings. This has been done, but it was impossible to secure mechanics who could lay an entirely satisfactory pavement in this manner—the consequence is that the pavement is a little rougher than is desirable for interior work. The difficulty can be easily overcome, however, by rubbing the pavement down. The bricks of which it is made are very hard and special devices will be required. Some experiments have been made for rubbing it down with an ordinary rubbing machine, such as is used by people laying mosaic and terrazzo floors. These experiments indicated very clearly that the machine in use was entirely too light, but they also indicated that there would be no difficulty in rubbing the pavement down successfully with a heavier machine, and with a rubbing wheel made of reasonably coarse carborundum. Such a machine should have at least a 5 or 6 horsepower motor, and the pressure on the rubbing wheel should be probably not less than 1 ton. A machine of this

description should not cost more than $500, and the mechanical staff of the War College could operate it.

One other point in connection with this building pertains to the lecture room. By reason of the semicircular form of this room and the hard finish of its walls, there is some reverberation. If the room were ever as completely furnished and fitted with soft hangings as an ordinary theater, this reverberation would entirely disappear. The presence of an audience filling the room to its capacity, or nearly so, would also practically eliminate the reverberation. It is not probable, however, that either of these conditions will often be obtained, and that some remnant of reverberation may exist and cause some little acoustic trouble. Should this prove true, it can be entirely remedied by stretching burlap or other canvas covering on the walls of the room and securing it without pasting it. This will give a soft surface from which the sound waves will not be reflected as they are at the present time from the hard plaster surface.

The present condition of appropriations for the War College building is as follows:

Amount appropriated by act of June 30, 1902	$400,000.00
Amount appropriated by act of April 23, 1904	300,000.00
Amount of Treasury transfer for mileage refunded to appropriation	187.04
	700,187.04
June 30, 1907, amount expended to date	699,194.12
July 1, 1907, balance unexpended	992.92
July 1, 1907, outstanding liabilities	992.92

ENGINEER SCHOOL.

All the work authorized under appropriations made at this point, up to and including the act of March 2, 1905, has been completed, and the accounts have been finally settled up. In the army appropriation act approved March 2, 1907, funds were appropriated for additional work under this project, as follows: For completion of two incomplete sets of noncommissioned officers' quarters, $15,000; for construction of one new stable, $17,000. For detailed history of this project reference is made to the Annual Report of the Chief of Engineers for the years 1902, 1903, 1904, 1905, and 1906.

The present condition of appropriations for buildings, Engineer School, Washington, D. C., is as follows:

Amount appropriated by act of June 30, 1902	$500,000.00
Amount appropriated by act of March 2, 1903	360,000.00
Amount appropriated by act of March 2, 1905	150,000.00
Amount appropriated by act of March 2, 1907	32,500.00
	1,042,500.00
June 30, 1907, amount expended to date	1,010,000.00
July 1, 1907, balance unexpended	32,500.00

All contracts on above works have been entirely completed.

Respectfully submitted.

JOHN STEPHEN SEWELL,
Captain, Corps of Engineers.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

APPENDIX M M M.

CONSTRUCTION OF BRIDGE OVER MISSISSIPPI RIVER AT FORT SNELLING, MINNESOTA.

REPORT OF CAPT. E. H. SCHULZ, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

The approved project will be found in the Report of the Chief of Engineers for 1907, part 1, page 861.

During the year a survey was made of the vicinity of the proposed bridge and borings made to determine the character of the foundations. Advertisements were issued June 5, 1907, for plans and specifications for a bridge at a cost of $230,000. The bids will be opened July 19, 1907. Part of the land required for approaches was purchased and preparations made to obtain the remainder by condemnation proceedings.

The following is a statement of the expenditures:

Surveys and borings	$1,115.88
Lands	2,980.20
Inspection	5.40
St. Paul office	26.95
Total	4,128.43

Money statement.

Amount received from Twin City Rapid Transit Company	$25,000.00
Amount appropriated by sundry civil act approved March 4, 1907	125,000.00
	150,000.00
June 30, 1907, amount expended during fiscal year	4,128.43
July 1, 1907, balance unexpended	145,871.57
July 1, 1907, outstanding liabilities	36.50
July 1, 1907, balance available	145,835.07

APPROPRIATIONS.

March 4, 1906		$125,000
Other funds:		
From city of St. Paul	$100,000	
From Twin City Rapid Transit Company	25,000	
		125,000
Total		250,000

APPENDIX N N N.

LAWS

AFFECTING

THE CORPS OF ENGINEERS, UNITED STATES ARMY.

FIFTY-NINTH CONGRESS, SECOND SESSION, 1906-1907.

CHAP. 36.—An Act To authorize the county of Allegheny, in the State of Pennsylvania, to construct a bridge across the Allegheny River, in Allegheny County, Pennsylvania.

January 12, 1907. [H. R. 21200.]

[Public, No. 12.]

Vol. 34, p. 848.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the county of Allegheny, in the State of Pennsylvania, a municipal corporation organized under the laws of Pennsylvania, its successors and assigns, be, and it is hereby, authorized to construct, maintain, and operate a bridge, and approaches thereto, across the Allegheny River, from a point at or near H street in the borough of Oakmont, Allegheny County, Pennsylvania, to Hulton Ferry, in the township of Harmar, in said county and State, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Allegheny River.

Allegheny County, Pa., may bridge.

Location.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, January 12, 1907.

[No. 2.] Joint Resolution Relating to the construction of a bridge at Fort Snelling, Minnesota.

January 12, 1907. [H. J. R. 196.]

[Pub. Res., No. 2.]

Vol. 34, p. 1418.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That all sums of money contributed and paid, or which may hereafter be contributed and paid, to the United States by the city of Saint Paul, Minnesota, or by any electric street railway company, under the provision of an Act of Congress approved March seventeenth, nineteen hundred and six, entitled "An Act to authorize the construction of a bridge between Fort Snelling Reservation and Saint Paul, Minnesota," shall be subject to the

Mississippi River.

Bridge across, between Fort Snelling Reservation and St. Paul, Minn.

Expenditure of contributions by St. Paul, etc.

order of the Secretary of War, and shall be expended in such manner as he may direct on account of any expenses incurred, or which may be hereafter incurred, by the United States, in or about the construction of the bridge, as provided by said Act; and that the time for commencing actual construction thereof is hereby extended one year from the date of the passage of this joint resolution.

Time for construction extended. Vol. 34, p. 68, amended.

Approved, January 12, 1907.

January 14, 1907. [H. R. 21951.] [Public, No. 14.] Vol. 34, p. 849.

CHAP. 149.—An Act To authorize the Alabama, Tennessee and Northern Railroad Company to construct a bridge across the Tombigbee River in the State of Alabama.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Alabama, Tennessee and Northern Railroad Company, a corporation organized under the laws of the State of Alabama, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad bridge and approaches thereto across the Tombigbee River at or near Stones Ferry, in Pickens County, in the State of Alabama, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Tombigbee River. Alabama, Tennessee and Northern Railroad Company may bridge, at Stones Ferry, Ala. Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, January 14, 1907.

January 18, 1907. [S. J. R. 76.] [Pub. Res., No. 5.] Vol. 34, p. 1419.

[No. 5.] Joint Resolution Providing for an extension of time for completing the highway bridge and approaches across the Potomac River at Washington, District of Columbia.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the time for completing the construction of the highway bridge and approaches across the Potomac River, authorized by section twelve of the Act of Congress approved February twelfth, nineteen hundred and one, entitled "An Act to provide for eliminating certain grade crossings on the line of the Baltimore and Potomac Railroad Company, in the city of Washington, District of Columbia, and requiring said company to depress and elevate its tracks, and to enable it to relocate parts of its railroad therein, and for other purposes," as amended by the District of Columbia appropriation Act, approved July first, nineteen hundred and two, and as amended by joint resolution providing for an extension of time for completing the highway bridge and approaches across the Potomac River, at Washington, District of Columbia,

District of Columbia. Highway bridge across the Potomac River. Time of construction extended. Vol. 31, p. 772. Vol. 32, p. 598.

approved February eighteenth, nineteen hundred and five, and as amended by joint resolution providing for an extension of time for completing the highway bridge and approaches across the Potomac River at Washington, District of Columbia, approved February nineteenth, nineteen hundred and six, be, and is hereby, extended to June thirtieth, nineteen hundred and seven.

Vol. 34, p. 821, amended.

Approved, January 18, 1907.

CHAP. 301.—An Act To authorize Thomas J. Ewing and George B. Patton, of Catlettsburg, Kentucky; Otto Burger, of Cincinnati, Ohio; Herbert Haynard, of Kenova, West Virginia, and Charles Miller, of Huntington, West Virginia, to construct a bridge across the Tug Fork of the Big Sandy River.

January 19, 1907. [H. R. 19523.] [Public, No. 21.] Vol. 34, p. 852.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Thomas J. Ewing, George B. Patton, Otto Burger, Herbert Haynard, and Charles Miller be, and they are hereby, authorized to construct, maintain, and operate a wagon, foot, and railroad bridge and approaches thereto across the Tug Fork of the Big Sandy River at or on the property of The Warfield Coal and Salt Company, at Warfield, Kentucky, where the said Tug River forms the boundary line between the States of West Virginia and Kentucky, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Tug Fork of Big Sandy River. Thomas Ewing and others may bridge at Warfield, Ky. Wagon, foot, and railroad bridge.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, January 19, 1907.

CHAP. 419.—An Act For the relief of Pollard and Wallace.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury be, and he is hereby, authorized to pay to the firm of Pollard and Wallace, of Champaign, Illinois, six thousand dollars, being the value of the plant leased by them to the Government, and used by the War Department in the construction of a lock and dam and construction work in the Osage River, near Osage City, Missouri, and still retained by the War Department for use in conjunction with the said work on said dam, but rendered useless to said Pollard and Wallace by reason of the failure of the War Department to complete said work by lack of proper appropriation therefor: *Provided*, That as a condition precedent to the payment of said six thousand dollars, the said Pollard

January 25, 1907. [S. 6299.] [Private, No. 384.] Vol. 34, part 2. Pollard and Wallace. Payment to, in re lock and dam, Osage River, Mo.

Proviso. Conveyance of title.

and Wallace shall convey to the United States a clear title in said plant, and the ownership thereof shall become vested in the United States upon the payment of said sum, and said sum is hereby appropriated for this purpose, out of any money in the Treasury not otherwise appropriated.

Approved, January 25, 1907.

January 29, 1907. [H. R. 23560.] [Public, No. 39.] Vol. 34, p. 866.

CHAP. 430.—An Act To authorize the construction of a bridge across the Columbia River between Benton and Franklin counties, in the State of Washington, by the North Coast Railroad Company.

Columbia River, Wash. North Coast Railroad Company may bridge.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the North Coast Railroad Company, a corporation existing under the laws of the State of Washington, its successors and assigns, be, and they are hereby, authorized to construct and maintain a bridge and approaches thereto across the Columbia River from some convenient and practical point, to be selected, on the east bank of said river in Franklin County to some convenient and practical point upon the west bank of said river in Benton County, in the State of Washington, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Location.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, January 29, 1907.

January 29, 1907. [H. R. 23561.] [Public, No. 40.] Vol. 34, p. 866.

CHAP. 431.—An Act To authorize the construction of a bridge across the Columbia River between Walla Walla and Benton counties, in the State of Washington, by the North Coast Railroad Company.

Columbia River, Wash. North Coast Railroad Company may bridge.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the North Coast Railroad Company, a corporation existing under the laws of the State of Washington, its successors and assigns, be, and they are hereby, authorized to construct and maintain a bridge and approaches thereto across the Columbia River from some convenient and practical point, to be selected, on the east bank of said river in Walla Walla County to some convenient and practical point on the west bank of said river in Benton County, in the State of Washington, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Location.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved. Amendment.

Approved, January 29, 1907.

CHAP. 439.—An Act Permitting the building of a railway bridge across the Mississippi River in Morrison County, State of Minnesota.

February 1, 1907. [S. 7827.]

[Public, No. 45.] Vol. 34, p. 868.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby granted to the Minneapolis, Saint Paul and Sault Sainte Marie Railway Company, a railway corporation organized under the laws of the States of Michigan, Wisconsin, Minnesota, and North Dakota, its successors or assigns, to build a railway bridge across the Mississippi River from a point on the west bank of said river in lot one of section thirty-two, township one hundred and twenty-eight north, range twenty-nine west, to a point on the east bank of said river in lot two of section twenty, township thirty-nine north, range thirty-two west, in the county of Morrison and State of Minnesota, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Mississippi River. Minneapolis, Saint Paul and Sault Sainte Marie Railway Company may bridge. Location.

Vol. 34, p. 84.

SEC. 2. That this Act shall be null and void unless the bridge herein authorized be commenced within one year and completed within two years from the date of approval of this Act.

Time of construction.

SEC. 3. That the right to alter, amend, or repeal this Act is hereby expressly reserved. Amendment.

Approved, February 1, 1907.

CHAP. 459.—An Act To amend an Act entitled "An Act to authorize Washington and Westmoreland counties, in the State of Pennsylvania, to construct and maintain a bridge across the Monongahela River, in the State of Pennsylvania," approved February twenty-first, nineteen hundred and three.

February 5, 1907. [H. R. 20988.]

[Public, No. 54.] Vol. 34, p. 876.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section seven of an Act entitled "An Act to authorize Washington and Westmoreland counties, in the State of Pennsylvania, to construct and maintain a bridge across the Monongahela River, in the State of Pennsylvania," approved February twenty-first, nineteen hundred and three, as amended by the Act approved January eleventh, nineteen hundred and five, and by the Act approved February twenty-first, nineteen hundred and six, be, and is hereby, amended to read as follows:

Monongahela River. Time extended for bridging, by Washington and Westmoreland counties, Pa. Vol. 32, p. 851. Vol. 33, p. 604. Vol. 34, p. 17, amended.

"SEC. 7. That this Act shall be null and void if actual Time of construction.

construction of the bridge herein authorized be not commenced within one year and completed within three years from February twenty-first, nineteen hundred and seven."

Approved, February 5, 1907.

February 5, 1907. [H. R. 21402.]

[Public, No. 55.]

Vol. 34, p. 876.

Savannah River, Ga. and S. C.

Savannah River Power Company may dam, at Gregg shoals.

CHAP. 460.—An Act Permitting the building of a dam across the Savannah River at Gregg shoals.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Savannah River Power Company, a corporation organized under the laws of South Carolina, its successors and assigns, is hereby authorized to construct and maintain a dam across the Savannah River, extending from a point in Elbert County, Georgia, to a point in South Carolina near the dividing line between Anderson County, South Carolina, and Abbeville County, South Carolina, upon or in the vicinity of Gregg shoals, and all works incident thereto in the utilization of the power thereby developed in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Vol. 34, p. 386.

Amendment.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Approved, February 5, 1907.

February 5, 1907. [H. R. 21677.]

[Public, No. 56.]

Vol. 34, p. 876.

Mississippi River, Iowa.

Time extended to construct canal by Davenport Water Power Company between Davenport and Le Claire.

Vol. 33, p. 159, amended.

CHAP. 461.—An Act To amend an Act granting to the Davenport Water Power Company rights to construct and maintain a canal, power station, and appurtenant works in the Mississippi River in Scott County, Iowa.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act granting to the Davenport Water Power Company rights to construct and maintain a canal, power station, and appurtenant works in the Mississippi River in Scott County, Iowa, approved April fifth, nineteen hundred and four, be, and it is hereby, amended as follows: In section three of said Act strike out the word "three" and insert the word "six" in lieu thereof; also strike out the word "six" and insert the word "nine" in lieu thereof.

Approved, February 5, 1907.

February 5, 1907. [H. R. 22135.]

[Public, No. 57.]

Vol. 34, p. 877.

Ashley River, S. C.

CHAP. 462.—An Act Authorizing the construction of a bridge across the Ashley River, in the counties of Charleston and Colleton, South Carolina.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the assent of the United States of America is hereby given to the Charleston and Saint Andrews

Railway Company, a corporation incorporated by the laws of the State of South Carolina, its successors and assigns, and such other persons as may be associated with it, to construct and maintain a bridge over the Ashley River, in the county of Charleston in the State aforesaid at a point suitable to navigation interests, in accordance with the provisions of an Act of Congress entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Charleston and St. Andrews Railway Company may bridge, in Charleston County.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 5, 1907.

CHAP. 463.—An Act To authorize the Chicago, Lake Shore and South Bend Railway Company to construct a bridge across the Calumet River in the State of Indiana.

February 5, 1907. [H. R. 23718.]

[Public, No. 58.]

Vol. 34, p. 877.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Chicago, Lake Shore and South Bend Railway Company, a corporation organized under the laws of the State of Indiana, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad bridge, and approaches thereto, across the Calumet River in the southeast quarter of section thirty-four, township thirty-seven north, range nine west, in Lake County, in the State of Indiana, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Calumet River, Ind.

Chicago, Lake Shore and South Bend Railway Company may bridge, in Lake County.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 5, 1907.

CHAP. 464.—An Act To authorize the board of commissioners of Lake County, Indiana, to construct a bridge across the Calumet River in the State of Indiana.

February 5, 1907. [H. R. 23939.]

[Public, No. 59.]

Vol. 34, p. 877.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the board of commissioners of Lake County, Indiana, be, and they are hereby, authorized to construct, maintain, and operate a public bridge, and approaches thereto, across the Calumet River at the intersection of Columbia avenue, a public street in the city of Hammond, in the State of Indiana, in accordance with the provisions of the Act entitled "An Act To regulate the construction

Calumet River.

Lake County, Indiana, may bridge, at Hammond, Ind.

Vol. 34, p. 84.

of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 5, 1907.

February 5, 1907. [H. R. 24111.]

[Public, No. 61.]

Vol. 34, p. 878.

CHAP. 466.—An Act To authorize the Norfolk and Western Railway Company to construct a bridge across the Potomac River, at or near Shepherdstown, West Virginia.

Potomac River.

Norfolk and Western Railway Company may bridge, at Shepherdstown, W. Va.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Norfolk and Western Railway Company, a corporation organized under the laws of the State of Virginia, its successors and assigns, be, and they are hereby, authorized, in the improvement and relocation of its line, to construct, maintain, and operate a bridge and approaches thereto across the Potomac River, at or near Shepherdstown, West Virginia, where the Potomac River forms the boundary line between the States of West Virginia and Maryland, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 5, 1907.

February 5, 1907. [H. R. 24275.]

[Public, No. 62.]

Vol. 34, p. 878.

CHAP. 467.—An Act Permitting the building of a dam across the Flint River at Porter Shoals.

Flint River, Ga.

Albany Power and Manufacturing Company may dam.

Location.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Albany Power and Manufacturing Company, a corporation organized under the laws of Georgia, its successors and assigns, is hereby authorized to construct and maintain a dam across the Flint River at a point in Dougherty County, Georgia, about one-fourth mile above the Georgia Northern Railway bridge across said river, upon or in the vicinity of Porter Shoals, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Vol. 34, p. 386.

Amendment.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Approved, February 5, 1907.

CHAP. 469.—An Act To authorize the Albany Railroad Bridge Company or the Chicago and Northwestern Railway Company to reconstruct a bridge across the Mississippi River.

February 6, 1907. [S. 7760.]

[Public, No. 64.] Vol. 34, p. 879.

Preamble.

Whereas the Albany Railroad Bridge Company, a corporation, owns, and the Chicago and Northwestern Railway Company, a corporation, has leased and is using, a railroad bridge across the Mississippi River between the city of Clinton, Iowa, and an opposite point on the main bank in the State of Illinois, and by reason of the age of said bridge and its inadequacy to present conditions and needs it is proposed to enlarge such bridge or replace it with a larger and more serviceable structure: Therefore

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That said Albany Railroad Bridge Company, or with its consent said Chicago and Northwestern Railway Company, its successors and assigns, are hereby authorized to enlarge said existing bridge across the Mississippi River, with its approaches, or to replace said bridge and its approaches with a new bridge and approaches in the same location as the existing bridge or south of such location and not more than one hundred feet therefrom, in accordance with the provisions of the Act of Congress entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six; and said enlarged or reconstructed bridge may be maintained and operated as a railroad bridge.

Mississippi River.

Albany Railroad Bridge Company or Chicago and Northwestern Railway Company may reconstruct bridge across, at Clinton, Iowa.

Vol. 34, p. 84.

Railroad bridge.

SEC. 2. That this Act shall be null and void unless the work of enlarging or replacing said bridge is begun within one year and is completed within three years from the date of the passage of this Act.

Time of reconstruction.

SEC. 3. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 6, 1907.

[No. 13.] Joint Resolution Declaring Sturgeon Bay, Illinois, not navigable water.

February 7, 1907. [H. J. R. 207.]

[Pub. Res. No. 13.] Vol. 34, p. 1421.

Sturgeon Bay, Ill.

Part of, declared not navigable waters.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That so much of the west fork of Sturgeon Bay within the county of Mercer and State of Illinois as lies west of the line between the east half and the west half of the east half of section twenty-five, in township fourteen north, range six west of the fourth principal meridian, and so much of the east fork of said Sturgeon Bay as lies north of the north line of section thirty, in township fourteen north, range five west of the fourth principal meridian, shall not be deemed navigable waters of the United States.

Approved, February 7, 1907.

February 8, 1907. [H. R. 23219.] [Public, No. 73.] Vol. 34, p. 883.

CHAP. 897.—An Act To authorize Majestic Collieries Company, of Eckman, West Virginia, to construct a bridge across Tug Fork of Big Sandy River about two and one-half miles west of Devon, West Virginia, a station on the Norfolk and Western Railway.

Tug Fork of Big Sandy River, W. Va. and Ky.
Majestic Collieries Company may bridge.
Railway bridge.
Location.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Majestic Collieries Company, of Eckman, West Virginia, a corporation organized under the laws of the State of West Virginia, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railway bridge and approaches thereto across the Tug Fork of Big Sandy River at a point about two and one-half miles west of Devon, West Virginia, a station on the Norfolk and Western Railway, in the States of West Virginia and Kentucky, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 8, 1907.

February 8, 1907. [H. R. 23383.] [Public, No. 74.] Vol. 34, p. 883.

CHAP. 898.—An Act To amend an Act entitled "An Act to authorize the city of Saint Louis, a corporation organized under the laws of the State of Missouri, to construct a bridge across the Mississippi River," approved June twenty-fifth, nineteen hundred and six.

Mississippi River.
Time extended for bridging, by St. Louis, Mo.
Vol. 34, p. 461, amended.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the city of Saint Louis shall have authority to construct the bridge mentioned in the Act entitled "An Act to authorize the city of Saint Louis, a corporation organized under the laws of the State of Missouri, to construct a bridge across the Mississippi River," approved June twenty-fifth, nineteen hundred and six, under and subject to the limitations and restrictions mentioned in said Act, if the actual construction of the bridge therein authorized shall be commenced within one year from the approval of this Act and completed within three years from same date.

Time of construction.

Approved, February 8, 1907.

February 8, 1907. [H. R. 24361.] [Public, No. 75.] Vol. 34, p. 884.

CHAP. 899.—An Act To amend an Act entitled "An Act to authorize the Mercantile Bridge Company to construct a bridge over the Monongahela River, Pennsylvania, from a point in the borough of North Charleroi, Washington County, to a point in Rostraver Township, Westmoreland County," approved March fourteenth, nineteen hundred and four.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assem-

bled, That section seven of an Act entitled "An Act to authorize the Mercantile Bridge Company to construct a bridge over the Monongahela River, Pennsylvania, from a point in the borough of North Charleroi, Washington County, to a point in Rostraver Township, Westmoreland County," approved March fourteenth, nineteen hundred and four, be, and is hereby, amended to read as follows:

Monongahela River, Pa. Time extended for bridging, by the Mercantile Bridge Company. Vol. 33, p. 82, amended.

"SEC. 7. That this Act shall be null and void unless the construction of said bridge shall be commenced within one year from the passage of this Act and shall be completed by March fourteenth, nineteen hundred and eight."

Time of construction.

Approved, February 8, 1907.

CHAP. 900.—An Act To authorize the Inter-State Bridge and Terminal Railway Company of Kansas City, Kansas, to construct a bridge across the Missouri River at or near Kansas City, Kansas.

February 8, 1907. [H. R. 24367.] [Public, No. 76.] Vol. 34, p. 884.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Inter-State Bridge and Terminal Railway Company of Kansas City, Kansas, a corporation organized under the laws of the State of Kansas, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a bridge, and approaches thereto, across the Missouri River from a point to be approved by the Secretary of War, in the county of Wyandotte, State of Kansas, to some point opposite on the north or left bank of said river in the county of Platte, State of Missouri, said bridge to be for the purpose of the passage of railway trains either by means of single track or double track, and also at the option of said company, its successors and assigns, to be used for the passage of wagons, vehicles, street cars, animals, and persons on foot and in vehicles, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Missouri River. Inter-State Bridge and Terminal Company may bridge, at Kansas City, Kans.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 8, 1907.

CHAP. 901.—An Act To authorize the Atlanta, Birmingham and Atlantic Railroad Company to construct a bridge across the Coosa River in the State of Alabama.

February 8, 1907. [H. R. 24603.] [Public, No. 77.] Vol. 34, p. 884.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assem-

Coosa River, Ala.
Atlanta, Birmingham and Atlantic Railroad Company may bridge, at Talladega.

bled, That the Atlanta, Birmingham and Atlantic Railroad Company, a corporation organized under the laws of the State of Alabama, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad bridge and approaches thereto across the Coosa River near Talladega, Talladega County, in the State of Alabama, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 8, 1907.

February 9, 1907.
[H. R. 24541.]
[Public, No. 79.]
Vol. 34, pp. 885, 887.

CHAP. 912.—An Act Making appropriations to supply additional urgent deficiencies in the apropriations for the fiscal year ending June thirtieth, nineteen hundred and seven, and for other purposes.

Urgent deficiencies appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, out of any money in the Treasury not otherwise appropriated, to supply urgent deficiencies in the appropriations for the fiscal year nineteen hundred and seven, and for other objects hereinafter stated, namely:

* * * * *

Jamestown Exposition.

JAMESTOWN EXPOSITION.

* * * * *

Piers, Hampton Roads.
Dredging channel.

PIERS, HAMPTON ROADS, JAMESTOWN EXPOSITION: For dredging necessary to complete the channel of approach to said piers from deep water in Hampton Roads and for dredging Bush Creek to accommodate the needs of the life-saving exhibit, sixty-five thousand dollars.

Approved, February 9, 1907.

February 15, 1907.
[H. R. 24109.]
[Public, No. 84.]
Vol. 34, p. 891.

CHAP. 922.—An Act To authorize the Norfolk and Western Railway Company to construct sundry bridges across the Tug Fork of the Big Sandy River.

Tug Fork of Big Sandy River.
Norfolk and Western Railway Company may construct bridges.
Location.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Norfolk and Western Railway Company, a corporation organized under the laws of the State of Virginia, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate bridges and approaches thereto across the Tug Fork of Big Sandy River at such points where the same forms the boundary line between the States of West Virginia

and Kentucky or the boundary line between the States of West Virginia and Virginia, as may be selected by said company and approved by the Secretary of War, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 15, 1907.

CHAP. 923.—An Act Providing for the construction of a bridge across the Mississippi River.

February 15, 1907. [H. R. 25123.]

[Public, No. 85.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Saint Louis Electric Bridge Company, a corporation organized under the laws of the State of Illinois, be, and is hereby, authorized to construct, maintain, and operate a railroad, wagon, and foot-passenger bridge, and all approaches thereto, across the Mississippi River at Saint Louis, Missouri, in accordance with the provision of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 892.

Mississippi River.

St. Louis Electric Bridge Company may bridge, at St. Louis, Mo.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 15, 1907.

CHAP. 927.—An Act To authorize the county of Clay, in the State of Arkansas, to construct a bridge across Black River at or near Bennetts Ferry, in said county and State.

February 16, 1907. [H. R. 23578.]

[Public, No. 88.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the county of Clay, one of the counties of the State of Arkansas, duly created and organized under the laws of said State, be, and it is hereby, authorized to construct, maintain, and operate a bridge and approaches thereto, across the Black River, at or near Bennetts Ferry, which is located on or near the south half of the north half of section four, in township twenty north, range five east, in said county, in the State of Arkansas, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 892.

Black River.

Clay County, Ark., may bridge, at Bennetts Ferry.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 16, 1907.

February 16, 1907. [H. R. 25043.]

[Public, No. 89.]

Vol. 34, p. 893.

CHAP. 928.—An Act To authorize the Atlanta, Birmingham and Atlantic Railroad Company to construct a bridge across the Chattahoochee River in the State of Georgia.

Chattahoochee River. Atlanta, Birmingham and Atlantic Railroad Company may bridge, at Lagrange, Ga.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Atlanta, Birmingham and Atlantic Railroad Company, a corporation duly organized under the laws, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad bridge and approaches thereto across the Chattahoochee River near Lagrange, Troup County, in the State of Georgia, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 16, 1907.

February 19, 1907. [S. 6872.]

[Public, No. 94.]

Vol. 34, p. 897.

CHAP. 990.—An Act To amend an Act entitled "An Act authorizing the Winnipeg, Yankton and Gulf Railroad Company to construct a combined railroad, wagon, and foot-passenger bridge across the Missouri River at or near the city of Yankton, South Dakota."

Missouri River. Time extended to Winnipeg, Yankton and Gulf Railroad Company for bridging, at Yankton, S. Dak.

Vol. 33, p. 157.

Vol. 34, p. 10, amended.

Time of construction.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section six of "An Act authorizing the Winnipeg, Yankton and Gulf Railroad Company to construct a combined railroad, wagon, and foot-passenger bridge across the Missouri River at or near the city of Yankton, South Dakota," approved April fifth, nineteen hundred and four, as amended by the Act approved February fifth, nineteen hundred and six, be, and the same is hereby, so amended that the time within which the said bridge is required to be commenced shall be within one year, and the time within which it is required that said bridge shall be completed shall be within three years from the date of the approval of this Act.

Approved, February 19, 1907.

February 20, 1907. [S. 7211.]

[Public, No. 97.]

Vol. 34, p. 911.

CHAP. 1135.—An Act To amend an Act entitled "An Act to amend an Act to construct a bridge across the Missouri River at a point between Kansas City and Sibley, in Jackson County, Missouri," approved March nineteenth, nineteen hundred and four.

Missouri River. Time extended for bridging, between Kansas City and Sibley, Mo.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section one of the Act entitled "An Act to amend an Act, to amend an Act to construct a bridge across the Missouri River at a point between Kansas City and Sibley, in Jackson County, Missouri," approved

March nineteenth, nineteen hundred and four, be and the same is hereby so amended as to read as follows:

Vol. 33, p. 142.

"SEC. 3. That the construction of the bridge authorized to be constructed by the Act approved March third, eighteen hundred and eighty-seven, hereinbefore named, and of which this Act is amendatory, shall begin within one year and be completed within three years from March nineteenth, nineteen hundred and seven, and unless these conditions are complied with this Act and the Acts of which it is amendatory shall be null and void: *Provided*, That such beginning of construction within said period of one year shall relate to the superstructure of said bridge above the piers heretofore constructed in the Missouri River in pursuance of the Act of which this Act is amendatory: *And provided further*, That in all matters and particulars not expressly provided for in the Act of which this Act is amendatory the construction, control, and use of such bridge shall be governed by the Act of Congress approved March twenty-third, nineteen hundred and six, entitled 'An Act to regulate the construction of bridges over navigable waters.'"

Time of construction.

Vol. 24, p. 493.

Vol. 33, p. 142, amended.

Provisos. Superstructure.

Vol. 34, p. 84.

SEC. 2. That the Congress reserves the right to change, alter, amend, or revise this Act and the Acts of which it is amendatory at any time.

Amendment.

Approved, February 20, 1907.

CHAP. 1136.—An Act To authorize the Missouri River Improvement Company, a Montana corporation, to construct a dam or dams across the Missouri River.

February 20, 1907. [S. 7515.]

[Public, No. 98.]

Vol. 34, p. 912.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of the Government is hereby given to the Missouri River Improvement Company, a Montana corporation, its successors or assigns, to construct across the Missouri River at some point or points, to be approved by the Secretary of War, between sections twenty and twenty-one, township twenty-one north, range five east, and the north line of township twenty-four north, range eight east, Montana meridian, a dam and canals and appurtenances thereof for water power and other purposes, in accordance with the provisions of the Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six, and in connection therewith a foot bridge or bridges for public use in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Missouri River.

Missouri River Improvement Company may dam (within 30 miles above Fort Benton, Mont.)

Vol. 34, p. 386.

Footbridge.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 20, 1907.

February 21, 1907. [S. 1726.]

[Public, No. 102.]

Vol. 34, p. 913.

CHAP. 1179.—An Act Making provision for conveying in fee the piece or strip of ground in Saint Augustine, Florida, known as "The Lines," for school purposes, to the board of public instruction of Saint Johns County, Florida.

Saint Augustine, Fla. "The Lines" deeded for school purposes to.

Condition.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War, upon the condition that the board of public instruction of Saint Johns County, Florida, shall lay and maintain a suitable drain from a point on Fort Marion Reservation near the city gates to the Matanzas or San Sebastian River, said drain to be approved by the Secretary of War and the work to be executed under the supervision of the local engineer, and the United States to have perpetual use of the same for said reservation, be, and he is hereby, authorized to deed to the board of public instruction of Saint Johns County, Florida, and its successors in office so much of the following-described piece or strip of Government land of the city of Saint Augustine, Florida, bounded by lines as follows: Commencing at a point north sixty-three degrees nine minutes west one hundred and thirty-two and eighty-six hundredths feet from a stone monument on the boundary line of Fort Marion Reservation, distant twenty and eighty-three hundredths feet east of the city gates and on the production eastward of a line following the north face of said gates, running thence south eighty-two degrees twenty-nine minutes west two thousand three hundred and ninety-three and forty-nine hundredths feet, more or less, to a point north seven degrees thirty-one minutes west one hundred and twenty-one feet from the intersection of the south boundary line of the United States reservation known as "The Lines" with the west boundary of Malaga street; thence south seven degrees thirty-one minutes east seventy-five feet; thence north eighty-two degrees twenty-nine minutes east two thousand three hundred and ninety-three and forty-nine hundredths feet, more or less; thence north seven degrees thirty-one minutes west seventy-five feet to the point of commencement (courses magnetic, variation two degrees thirty minutes east), as the said Secretary of War may deem sufficient for school purposes: *Provided*, That said deed shall contain a clause to the effect that whenever said property, or any portion thereof, ceases to be used for school purposes, so much of the same as is not so used shall revert to and become the property of the United States.

Description.

Proviso.

Reversion.

Approved, February 21, 1907.

CHAP. 1181.—An Act Granting to the Los Angeles Inter-Urban Railway Company a right of way for railroad purposes through the United States military reservation at San Pedro, California.

February 21, 1907. [S. 7879.]

[Public, No. 104.] Vol. 34, p. 915.

San Pedro Military Reservation, Cal.

Right of way over, to Los Angeles Inter-Urban Railway Company.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby granted and leased to the Los Angeles Inter-Urban Railway Company, a corporation organized and existing under the laws of the State of California, and its successors and assigns, authority to construct, maintain, and operate a railroad, to be operated by electricity or other motive power, over and through the United States military reservation at San Pedro, in the county of Los Angeles, State of California, on such line and location as may be approved by the Secretary of War.

Termination of right.

SEC. 2. That said right of way hereby granted and leased to said Los Angeles Inter-Urban Railway Company shall be subject to termination by the Secretary of War upon sixty days' previous notice; and if said company shall fail or refuse to remove its tracks, poles, wires, and other structures and appurtenances from the reservation within said period of sixty days after notification so to do, then and in that event the Secretary of War may cause the same to be removed at the expense of the said company and without liability to damages therefor.

Rental.

SEC. 3. That said company shall pay such reasonable annual rental for such right of way and at such time as may be fixed by the Secretary of War.

Secretary of War to approve additions, etc.

SEC. 4. That no structure other than said railroad and the necessary poles and wires for the operation of the same shall be placed upon said right of way hereby granted and leased without being first approved by the Secretary of War.

Approved, February 21, 1907.

CHAP. 1182.—An Act To extend the time for the completion of the Valdez, Marshall Pass and Northern Railroad, and for other purposes.

February 21, 1907. [S. 8283.]

[Public, No. 105.] Vol. 34, p. 915.

Alaska.

Valdez, Marshall Pass and Northern Railroad Company.

Vol. 30, p. 410.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time for the compliance of the Valdez, Marshall Pass and Northern Railroad Company with the provisions of sections four and five of chapter two hundred and ninety-five of the laws of the United States, entitled "An Act extending the homestead laws and providing for the right of way for railroads in the district of Alaska, and for other purposes," approved May fourteenth, eighteen hundred and ninety-eight, by locating and completing its railroad in Alaska, is hereby extended—

Time extended for building road.

First. Said company shall have three years from the passage of this Act within which to complete the first twenty miles of its railroad, by way of Keystone Canyon, Marshall Pass to Copper River, and from thence to Tanana River, and six years from the date of the passage of this Act within which to complete said railroad to the Tanana River, all to be within such rights as it possesses and not in any way affecting or contravening any vested rights of any other company or person or the rights of the Government, provided said company carry out the requirements of law.

* * * * *

Amendment.

Third. Congress reserves the right to alter, amend, or repeal this Act.

Approved, February 21, 1907.

February 25, 1907. [S. 6691.]

[Public, No. 108.]

Vol. 34, p. 926.

CHAP. 1185.—An Act Granting to the Columbia Valley Railroad Company a right of way through Fort Columbia Military Reservation, at Scarborough Head, in the State of Washington, and through the United States quarantine station in section seventeen, township nine north, range nine west of Willamette meridian, in said State of Washington, and for other purposes.

Fort Columbia Military Reservation, Wash.

Columbia Valley Railroad Company granted right of way through.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War may authorize the Columbia Valley Railroad Company to build a railroad and telegraph line through the Military Reservation at Scarborough Head, known as Fort Columbia, Washington, and to that end may set aside for occupancy by said Columbia Valley Railroad Company such ground, and no more, as is actually required for the track, embankment, trestle, and necessary buildings: *Provided*, That the ground so occupied shall remain the property of the United States under such police and other military control as the military authorities may deem it necessary to exercise: *Provided further*, That the location and grade of said railroad, the design and location of the station house and other buildings, and all other details of construction within the limits of the reservation, also all matters pertaining to the operation and maintenance of said railroad, shall be under such regulations as the Secretary of War may from time to time establish: *Provided further*, That nothing in this Act shall be construed as authorizing the use of any portion of the reservation as a borrow pit for fills and embankments: *Provided further*, That the said railroad company shall pay such reasonable annual rental for such right of way as may be fixed by the Secretary of War.

Provisos. Police.

Location, etc., to be approved by Secretary of War.

Restriction.

Rent.

* * * * *

Approved, February 25, 1907.

CHAP. 1186.—An Act To amend an Act to authorize the construction of two bridges across the Cumberland River at or near Nashville, Tennessee.

February 25, 1907. [S. 8274.]

[Public, No. 109.] Vol. 34, p. 927.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That an Act entitled "An Act to authorize the construction of two bridges across the Cumberland River at or near Nashville, Tennessee," approved April twenty-fourth, nineteen hundred and six, be so amended as to extend the time for commencing the construction of said bridges one year, and for completing the same three years, from April twenty-fourth, nineteen hundred and seven.

Cumberland River. Time extended to Davidson County, Tenn., for bridging, at Nashville. Vol. 34, p. 135, amended.

Approved, February 25, 1907.

CHAP. 1192.—An Act To authorize J. F. Andrews, J. W. Jourdan, their heirs, representatives, associates, and assigns, to construct dams and power stations on Bear River, on the southeast quarter of section thirty-one, township five, range eleven, in Tishomingo County, Mississippi.

February 25, 1907. [H. R. 21194.]

[Public, No. 115.] Vol. 34, p. 929.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That J. F. Andrews, J. W. Jourdan, their heirs, representatives, associates, and assigns may hereafter erect, maintain, and use a dam or dams in or across the Bear River, in the State of Mississippi, at such points on the southeast quarter of section thirty-one, township five, range eleven, in Tishomingo County, Mississippi, as they may elect, for the purpose of erecting, operating, and maintaining power stations, and to maintain inlet and outlet races or canals, and to make such other improvements on Bear River as may be necessary for the development of water power and the transmission of the same, in accordance with the provisions of the Act of Congress entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six: *Provided*, That this Act shall in no manner interfere with or impair the rights of any person, company, or corporation heretofore authorized by Congress to erect a dam or other structure for the development of water power on Bear River.

Bear River. J. F. Andrews et al. may construct dam across, in Tishomingo County, Miss.

Vol. 34, p. 386.

Proviso. Restriction.

SEC. 2. That the right to alter, amend, or repeal this Act is expressly reserved.

Amendment.

Approved, February 25, 1907.

CHAP. 1196.—An Act Authorizing the construction of a dam across the Pend d'Oreille River, in the State of Washington, by the Pend d'Oreille Development Company, for the development of water power, electrical power, and for other purposes.

February 25, 1907. [H. R. 24760.]

[Public, No. 119.] Vol. 34, p. 931.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby granted to,

Pend Oreille River, Wash.

Pend d'Oreille Development Company may dam.

and it shall be lawful for, the Pend d'Oreille Development Company, a corporation duly incorporated under the laws of the State of Washington, its successors or assigns, to construct and maintain a dam across the Pend d'Oreille River at a point at or about where Pierwee Creek empties into the Pend d'Oreille River, near the international boundary line in the county of Stevens, State of Washington, at such point to be selected by the said Pend d'Oreille Development Company, its successors or assigns, at the mouth of said Pierwee Creek, or within one thousand feet above or below the same, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Location.

Vol. 34, p. 386.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 25, 1907.

February 25, 1907. [H. R. 24821.] [Public, No. 120.]

CHAP. 1197.—An Act To authorize the Georgia Southwestern and Gulf Railroad Company to construct a bridge across the Chattahoochee River between the States of Alabama and Georgia.

Vol. 34, p. 931.

Chattahoochee River. Georgia Southwestern and Gulf Railroad may bridge, at Steammill, Ga.

Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Georgia Southwestern and Gulf Railroad Company, a corporation organized under the laws of the State of Georgia, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad bridge and approaches thereto across the Chattahoochee River at or near Steammill, in Decatur County, in the State of Georgia, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this act is hereby expressly reserved.

Approved, February 25, 1907.

February 25, 1907. [H. R. 25046.] [Public, No. 123.]

CHAP. 1200.—An Act To authorize the construction of a bridge across the Mississippi River at Louisiana, Missouri.

Vol. 34, p. 933.

Mississippi River. D. A. Ball et al. may bridge, at Louisiana, Mo.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That D. A. Ball, R. H. Goodman, Harry Higbee, William E. Williams, Charles Dustin, Ed. A. Glenn, and David Wald, their successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad, electric road, and highway bridge and approaches thereto across the Mississippi River, at Louisiana, in the State of Missouri, in accordance with the provisions of the Act entitled "An Act to regulate the con-

Vol. 34, p. 84.

struction of bridges over navigable waters," approved March Twenty-third, nineteen hundred and six.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved. Amendment.

Approved, February 25, 1907.

CHAP. 1201.—An Act Permitting the building of a dam across Rock River at Lyndon, Illinois.

February 25, 1907. [H. R. 25234.]

[Public, No. 124.]

Vol. 34, p. 933.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Edward A. Smith, Harvey S. Green, and John J. Hurlbert, of Morrison, Illinois, their heirs, administrators, executors, successors, and assigns, are hereby authorized to construct and maintain a dam across Rock River at or near Lyndon, Whiteside County, Illinois, the south end of said dam to be located near the line between sections twenty-one and twenty-two in township twenty north, range five east, fourth principal meridian, and the north end of said dam to intersect the bank of said river in section twenty-one in the same township, range, and meridian, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Rock River. Edward A. Smith et al. may dam, at Lyndon, Ill.

Vol. 34, p. 386.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved. Amendment.

Approved, February 25, 1907.

CHAP. 1202.—An Act To authorize the New Orleans and Great Northern Railroad Company to construct a bridge across Pearl River, in the State of Mississippi.

February 25, 1907. [H. R. 25366.]

[Public, No. 125.]

Vol. 34, p. 933.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the New Orleans and Great Northern Railroad Company, a corporation organized under the laws of the State of Mississippi, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad drawbridge and approaches thereto across the Pearl River at or near Columbia, in Marion County, in the State of Mississippi, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Pearl River. New Orleans and Great Northern Railroad Company may bridge, at Columbia, Miss.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved. Amendment.

Approved, February 25, 1907.

February 26, 1907.
[H. R. 21574.]
[Public, No. 129.]
Vol. 34, pp. 935, 966, 967, 993, 994.

CHAP. 1635.—An Act Making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and eight, and for other purposes.

Legislative, executive, and judicial expenses appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, out of any money in the Treasury not otherwise appropriated, in full compensation for the service of the fiscal year ending June thirtieth, nineteen hundred and eight, for the objects hereinafter expressed, namely:

* * * * *

War Department.

WAR DEPARTMENT.

* * * * *

Engineers' office.

OFFICE OF THE CHIEF OF ENGINEERS: For chief clerk, two thousand dollars; two chiefs of division, at two thousand dollars each; eight clerks of class four; eleven clerks of class three; twelve clerks of class two; fifteen clerks of class one; nine clerks, at one thousand dollars each; eleven clerks, at nine hundred dollars each; six messengers; three assistant messengers; and two laborers; in all, one hundred thousand two hundred and twenty dollars.

Skilled draftsmen, etc.

And the services of skilled draftsmen, civil engineers, and such other services as the Secretary of War may deem necessary, may be employed in the office of the Chief of Engineers, to carry into effect the various appropriations for rivers and harbors, fortifications, and surveys, to be paid from such appropriations: *Provided*, That the expenditures on this account for the fiscal year ending June thirtieth, nineteen hundred and eight, shall not exceed ten thousand dollars; and that the Secretary of War shall each year, in the annual estimates, report to Congress the number of persons so employed, their duties, and the amount paid to each.

Proviso. Limit, etc.

* * * * *

Public buildings and grounds.

PUBLIC BUILDINGS AND GROUNDS.

Engineer, clerks, etc.

OFFICE OF PUBLIC BUILDINGS AND GROUNDS: For one assistant engineer, two thousand four hundred dollars; assistant and chief clerk, two thousand four hundred dollars; one clerk of class four; one clerk of class three; clerk and stenographer, one thousand four hundred dollars; one messenger; landscape gardener, two thousand four hundred dollars; surveyor and draftsman, one thousand five hundred dollars; in all, fourteen thousand three hundred and forty dollars.

For foremen, gardeners, mechanics, and laborers employed in the public grounds, thirty-one thousand two hundred dollars.

For one sergeant of park watchmen, nine hundred and fifty dollars. Watchmen.

For day watchmen as follows: One in Franklin Park; one in Lafayette Park; two in Smithsonian grounds; one in Judiciary Park; one in Lincoln Park and adjacent reservations; one at Iowa Circle; one at Thomas Circle and neighboring reservations; one at Washington Circle and neighboring reservations; one at Dupont Circle and neighboring reservations; one at McPherson and Farragut parks; one at Stanton Park and neighboring reservations; two at Henry and Seaton parks; one at Mount Vernon Park and adjacent reservations; one for the greenhouses and nursery; two at grounds south of Executive Mansion; one at Garfield Park; one at Monument Park; and one at Monument Park Annex (Potomac Park); twenty-one in all, at seven hundred and twenty dollars each, fifteen thousand one hundred and twenty dollars.

For night watchmen as follows: Two in Smithsonian grounds; one in Judiciary Park; two in Henry and Seaton parks; one in grounds south of Executive Mansion; one in Monument Park; one at Monument Park Annex (Potomac Park); and two in Garfield Park; ten in all, at seven hundred and twenty dollars each, seven thousand two hundred dollars.

For watchman for the care of the monument and dock at Wakefield, Virginia, the birthplace of Washington, three hundred dollars. Wakefield, Va.

One day watchman and one night watchman for that part of Potomac Park between the causeway of the Pennsylvania Railroad bridge, the Potomac River, and the tidal reservoir, two in all, at seven hundred and twenty dollars each, one thousand four hundred and forty dollars.

One night watchman in that part of Potomac Park between the Virginia channel of the Potomac River, the tidal reservoir, and the sewer canal, seven hundred and twenty dollars.

Night watchmen for Stanton and Lincoln parks and ten adjoining reservations, Lafayette, Franklin, McPherson, and Farragut parks, Washington, Dupont, Iowa, and Thomas circles, Mount Vernon Square, and reservations on Massachusetts avenue from Seventh to Seventeenth streets, four in all, at seven hundred and twenty dollars each, two thousand eight hundred and eighty dollars.

For contingent and incidental expenses, including purchase of professional and scientific books and periodicals, books of reference, blank books, photographs, and maps, seven hundred dollars. Contingent expenses.

Of the foregoing amounts appropriated under Public Buildings and Grounds, the sum of thirty thousand one hundred and five dollars shall be paid out of the revenues of the District of Columbia. Amount from District revenues.

* * * * *

Pay of switch-board operators, assistant messengers, laborers, etc., rated.

SEC. 2. The pay of telephone switch-board operators, assistant messengers, firemen, watchmen, laborers, and charwomen provided for in this Act, except those employed in mints and assay offices, unless otherwise specially stated, shall be as follows: For telephone switch-board operators, assistant messengers, firemen, and watchmen, at the rate of seven hundred and twenty dollars per annum each; for laborers, at the rate of six hundred and sixty dollars per annum each, assistant telephone switch-board operators at the rate of six hundred dollars each, and for charwomen, at the rate of two hundred and forty dollars per annum each.

No pay to permanently incapacitated persons.

SEC. 3. The appropriations herein made for the officers, clerks, and persons employed in the public service shall not be available for the compensation of any persons incapacitated otherwise than temporarily for performing such service, and the heads of Departments shall cause this provision to be enforced.

* * * * *

Repeal.

SEC. 5. That all laws or parts of laws inconsistent with this Act are repealed.

Approved, February 26, 1907.

February 27, 1907. [S. 8182.] [Public, No. 134.] Vol. 34, p. 1000.

CHAP. 2074.—An Act Authorizing the Twin City Power Company to build two dams across the Savannah River above the city of Augusta, in the State of Georgia.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Twin City Power Company, a corporation organized under the laws of the State of South Carolina, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across the Savannah River, at or near where Dortons Creek, in the county of Edgefield, State of South Carolina, empties into the Savannah River, and also a dam across the said river at or near the southern end of Prices Island in said river and about five miles from the mouth of Dortons Creek in the State of South Carolina, in accordance with the provisions of the Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six: *Provided*, That one of said dams shall be completed within three years, and the other within five years from the passage of this Act.

Savannah River. Twin City Power Company may dam, at Dortons Creek and at Prices Island, S. C.

Vol. 34, p. 386.

Proviso. Time of construction.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 27, 1907.

CHAP. 2077.—An Act To amend section thirteen of an Act of March first, eighteen hundred and ninety-three, entitled "An Act to create the California Débris Commission and regulate hydraulic mining in the State of California."

February 27, 1907.
[H. R. 13367.]
[Public, No. 137.]
Vol. 34, p. 1001.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section thirteen of an Act of March first, eighteen hundred and ninety-three, entitled "An Act to create the California Débris Commission and to regulate mining in the State of California," is hereby amended so as to read as follows:

California Débris Commission.
Vol. 27, p. 508.

"SEC. 13. That in case a majority of the members of said Commission, within thirty days after the time so fixed, concur in the decision in favor of the petitioner or petitioners, the said Commission shall thereupon make an order directing the methods and specifying in detail the manner in which operations shall proceed in such mine or mines; what restraining or impounding works, if any, if facilities therefor can be found, shall be built and maintained; how and of what material; where to be located; and in general set forth such further requirements and safeguards as will protect the public interests and prevent injury to the said navigable rivers and the lands adjacent thereto, with such further conditions and limitations as will observe all the provisions of this Act in relation to the working thereof and the payment of taxes on the gross proceeds of the same: *Provided*, That all expense incurred in complying with said order shall be borne by the owner or owners of such mine or mines: *And provided further*, That where it shall appear to said Commission that hydraulic mining may be carried on without injury to the navigation of said navigable rivers and the lands adjacent thereto, an order may be made authorizing such mining to be carried on without requiring the construction of any restraining or impounding works or any settling reservoirs: *And provided also*, That where such an order is made a license to mine, no taxes provided for herein on the gross proceeds of such mining operations shall be collected."

Favorable decisions within thirty days.

Order directing methods of mining, etc.

Taxes on gross proceeds.

Provisos.
Expenses.

Hydraulic mining without impounding works, etc.
Vol. 27, p. 509, amended.

No tax on gross proceeds to be collected.
Vol. 27, p. 509, amended.

Approved, February 27, 1907.

CHAP. 2078.—An Act To authorize the Mingo-Martin Coal Land Company to construct a bridge across Tug Fork of Big Sandy River at or near mouth of Wolf Creek.

February 27, 1907.
[H. R. 19312.]
[Public, No. 138.]
Vol. 34, p. 1002.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Mingo-Martin Coal Land Company, a corporation organized under the laws of West Virginia, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad and foot bridge and approaches thereto across the Tug Fork of Big Sandy River at or near Wolf Creek, in the State of Ken-

Tug Fork of Big Sandy River.
Mingo-Martin Coal Land Company may bridge, at Wolf Creek, Ky.

Vol. 34, p. 84.

tucky, in acordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 27, 1907.

February 27, 1907. [H. R. 22338.]

[Public, No. 140.]

CHAP. 2080.—An Act To bridge Bayou Bartholomew in Louisiana.

Vol. 34, p. 1003.

Bayou Bartholomew, La.

Arkansas, Louisiana and Gulf Railway Company may bridge.

Location.

Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Arkansas, Louisiana and Gulf Railway Company is hereby authorized to construct a drawbridge across Bayou Bartholomew, in the State of Louisiana, at a suitable point in township twenty-two north, range six east, about seven miles north of the town of Bastrop, in accordance with the provisions of an Act of Congress entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 27, 1907.

February 27, 1907. [H. R. 23218.]

[Public, No. 142.]

CHAP. 2082.—An Act To authorize the Kentucky and West Virginia Bridge Company to construct a bridge across the Tug Fork of Big Sandy River at or near Williamson, in Mingo County, West Virginia, to a point on the east side of said river in Pike County, Kentucky.

Vol. 34, p. 1004.

Tug Fork of Big Sandy River.

Kentucky and West Virginia Bridge Company may bridge, at Williamson, W. Va.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Kentucky and West Virginia Bridge Company, a corporation organized under the laws of the State of Kentucky, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railway and highway traffic bridge and approaches thereto across the Tug Fork of Big Sandy River, at or near Williamson, in Mingo County, West Virginia, to a point on the east side of said river in Pike County, Kentucky, in the States of Kentucky and West Virginia, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 27, 1907.

[No. 17.] Joint Resolution Relating to the holders of medals of honor.

February 27, 1907.
[H. J. R. 223.]

[Pub. Res., No. 17.]
Vol. 34, p. 1422.
Medals of honor.
Surrendered medals returned to holders of.
Vol. 12, pp. 623, 751.
Vol. 33, p. 274.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the holders of medals of honor under the Act approved July twelfth, eighteen hundred and sixty-two, and section six of the Act approved March third, eighteen hundred and sixty-three, shall not be required to surrender such medals in case such medals are replaced, in pursuance of the provisions of the Act of Congress approved April twenty-third, nineteen hundred and four; and that wherever the holders of such medals of honor have surrendered them, in order to receive the medals provided for by said Act approved April twenty-third, nineteen hundred and four, such medals shall be returned to them: *Provided*, That no recipient of both medals shall wear both medals at the same time.

Proviso. Restriction.

Approved, February 27, 1907.

CHAP. 2116.—An Act For the relief of Edwin T. Hayward, executor of Columbus F. Hayward, and the administrator of Charlotte G. Hayward.

February 28, 1907.
[H. R. 12686.]

[Private No. 1969.]
Vol. 34, part 2.
Edwin T. Hayward.
Payment to, as executor of Columbus F. Hayward, etc., in re damages to land at Dam No. 4, Muskingum River, Ohio.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury be, and he is hereby, authorized and directed to pay to Edwin T. Hayward, executor of the last will and testament of Columbus F. Hayward, deceased, out of any money in the Treasury of the United States not otherwise appropriated, the sum of seven hundred and fourteen dollars, and to Edwin T. Hayward, administrator de bonis non, with the will annexed, of Charlotte G. Hayward, deceased, the sum of nine hundred and thirty-nine dollars, the said sums being in payment of damages to land belonging to said Columbus F. Hayward and Charlotte G. Hayward, respectively, which was washed away and overflowed by reason of the extension of end of dam numbered four in the Muskingum River in the month of July, eighteen hundred and ninety: *Provided, however*, That before payment of said sums of money, or either of them, Edwin T. Hayward, as executor as aforesaid, and as such administrator, shall convey or cause to be conveyed to the United States, by deed duly acknowledged for record, the two parcels of land so damaged, containing together four and fifty-one one-hundredths acres, according by metes and bounds to be furnished by the Chief of Engineers of the United States Army.

Proviso. Deed.

Approved, February 28, 1907.

February 28, 1907. [H. R. 18865.]

[Private, No. 1971.] Vol. 34, part 2.

John and David West. Reimbursement in re damage to dock in Columbia River at Cathlamet, Wash.

CHAP. 2118.—An Act For the relief of John and David West.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury be, and he is hereby, authorized and directed to pay to John and David West, of Cathlamet, Wahkiakum County, State of Washington, out of any money in the Treasury not otherwise appropriated, the sum of eighty-eight dollars and fifty cents, as a reimbursement in full for all damage to their dock or wharf in the Columbia River at Cathlamet accidentally inflicted by the United States dredge W. S. Ladd in the month of December, nineteen hundred and one.

Approved, February 28, 1907.

March 1, 1907. [S. 8510.]

[Public, No. 153.] Vol. 34, pp. 1012, 1013.

Public printing and binding. Vol. 28, p. 601, amended.

CHAP. 2284.—An Act To amend an Act providing for the public printing and binding and the distribution of public documents.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section two of the Act approved January twelfth, eighteen hundred and ninety-five, providing for the public printing and binding and the distribution of public documents, be amended to read as follows:

"SEC. 2. PARAGRAPH 1. * * *

* * * * *

Estimates for printing certain departmental reports.

"PAR. 6. * * * Any Executive Department, bureau, board, or independent office of the Government submitting reports or documents in response to inquiries from Congress shall submit therewith an estimate of the probable cost of printing to the usual number. Nothing in this paragraph relating to estimates shall apply to reports or documents not exceeding fifty pages.

Exception.

* * * * *

Approved, March 1, 1907.

March 2, 1907. [S. 8400.]

[Public, No. 164.] Vol. 34, p. 1058.

Mississippi River. Dam at Sauk Rapids, Minnesota. Vol. 33, p. 53, amended.

CHAP. 2505.—An Act To amend an Act entitled "An Act permitting the building of a dam across the Mississippi River at or near the village of Sauk Rapids, Benton County, Minnesota," approved February twenty-sixth, nineteen hundred and four.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section three of an Act entitled "An Act permitting the building of a dam across the Mississippi River at or near the village of Sauk Rapids, Benton County, Minnesota," approved February twenty-sixth, nineteen hundred and four, be, and the same is hereby, amended so as to read as follows:

"SEC. 3. That this Act shall be null and void unless the dam herein authorized be commenced within three years and six months and be completed within six years from the time of the passage of this Act."

Time extended for construction.

Approved, March 2, 1907.

CHAP. 2506.—An Act To extend the time for the completion of a bridge across the Missouri River at Yankton, South Dakota, by the Yankton, Norfolk and Southern Railway Company.

March 2, 1907. [S. 8446.] [Public, No. 165.] Vol. 34, p. 1058.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section six of the Act approved March ninth, nineteen hundred and four, authorizing the Yankton, Norfolk and Southern Railway Company to construct a combined railroad, wagon, and foot-passenger bridge across the Missouri River at or near the city of Yankton, South Dakota, as amended by the Act approved February fifth, nineteen hundred and six, be, and is hereby, amended by extending the time for commencing the construction of said bridge to March ninth, nineteen hundred and eight, and by extending the time for completing said bridge to March ninth, nineteen hundred and ten.

Missouri River. Time extended for bridge at Yankton, S. Dak., by Yankton, Norfolk and Southern Railway Company. Vol. 33, pp. 62, 621. Vol. 34, p. 9, amended.

Approved, March 2, 1907.

CHAP. 2507.—An Act Making appropriations for fortifications and other works of defense, for the armament thereof, for the procurement of heavy ordnance for trial and service, and for other purposes.

March 2, 1907. [H. R. 23821.] [Public, No. 166.] Vol. 34, pp. 1058, 1061, and 1062.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sums of money herein provided for be, and the same are hereby, appropriated, out of any money in the Treasury not otherwise appropriated, to be available until expended, namely:

Fortifications appropriations.

FORTIFICATIONS AND OTHER WORKS OF DEFENSE.

For modernizing older emplacements, one hundred thousand dollars.

Modernizing older emplacements.

For construction of fire-control stations and accessories, including purchase of lands and rights of way, and for the purchase, installation, operation, and maintenance of necessary lines and means of electrical communication, including telephones, dial and other telegraphs, wiring and all special instruments, apparatus, and materials, coast signal apparatus, and salaries of electrical experts, engineers, and other necessary employees, connected with the use of coast artillery; for the purchase, manufacture, and test of range finders and other instruments for fire

Fire-control stations, etc.

Range finders, etc.

control at the fortifications, and the machinery necessary for their manufacture at the arsenals, nine hundred thousand dollars.

Searchlights. For purchase and installation of searchlights for the defenses of our most important harbors, two hundred and ten thousand dollars.

Preservation, etc. For the protection, preservation, and repair of fortifications for which there may be no special appropriation available, two hundred thousand dollars.

Fort Moultrie, S. C. Protecting wall. Toward the construction of about four thousand eight hundred linear feet of wall necessary for the protection of Fort Moultrie, Sullivans Island, South Carolina, from the effects of storms (to cost not to exceed two hundred and twenty-five thousand six hundred dollars), one hundred thousand dollars.

Forts Pickens and McRee, Fla. Sea walls, etc. Toward the building sea walls for the protection of the sites of the fortifications and of the necessary post buildings at Forts Pickens and McRee, Pensacola Harbor, Florida (to cost not to exceed nine hundred and seven thousand one hundred dollars), four hundred thousand dollars.

Pensacola, Fla. Repair of batteries, etc. Toward the repair and restoration of batteries and other structures appurtenant to the defenses of Pensacola and for retaining walls to protect the batteries from floods (to cost not to exceed one hundred and nine thousand three hundred and fifty-five dollars), fifty thousand dollars.

Mobile, Ala. Repair of defenses. Toward the repair and restoration of batteries and other structures appurtenant to the defenses of Mobile, Alabama, and for rebuilding sea walls and groins for protection of the sites of the fortifications and of the garrison posts (to cost not to exceed one million eighty-nine thousand five hundred dollars), five hundred thousand dollars.

Fort St. Philip, La. Rebuilding levees. For rebuilding and strengthening the levees for protection of the site of the defenses and the garrison post at Fort Saint Philip, New Orleans, Louisiana, one hundred thousand dollars.

Plans. For preparation of plans for fortifications, five thousand dollars.

Electric plants. For tools, electrical and engine supplies and appliances, to be furnished by the Engineer Department, for the use of the troops for maintaining and operating electric light and power plants in gun and mortar batteries, forty thousand dollars.

Sea walls. For construction of sea walls and embankments, twenty-five thousand dollars.

Torpedo structures. PRESERVATION AND REPAIR OF TORPEDO STRUCTURES: For preservation and repair of structures erected for the torpedo defense of the United States, ten thousand dollars.

Submarine mines. For the construction of mining casemates, cable galleries, torpedo storehouses, cable tanks, and other structures necessary for the operation, preservation, and care

of submarine mines and their accessories, one hundred and seventy-five thousand dollars, to be expended by the Engineer Department.

* * * * *

FORTIFICATIONS IN INSULAR POSSESSIONS.

Insular possessions.

For construction of seacoast batteries in the Hawaiian Islands, two hundred thousand dollars.

Seacoast batteries. Hawaiian Islands.

For construction of seacoast batteries in the Philippine Islands, five hundred thousand dollars.

Philippine Islands.

For construction of fire-control stations and accessories, including purchase of lands and rights of way, and for the purchase, installation, operation, and maintenance of necessary lines and means of electrical communication, including telephones, dial and other telegraphs, wiring and all special instruments, apparatus, and materials, coast signal apparatus, and salaries of electrical experts, engineers, and other necessary employees, connected with the use of coast artillery; for the purchase, manufacture, and test of range finders and other instruments for fire control at the fortifications, and the machinery necessary for their manufacture at the arsenals, one hundred thousand dollars.

Fire-control stations, etc.

Range finders, etc.

For purchase and installation of searchlights for the defenses of most important harbors, thirty thousand dollars.

Searchlights.

For the construction of mining casemates, cable galleries, torpedo storehouses, cable tanks, and other structures necessary for the operation, preservation, and care of submarine mines and their accessories, two hundred thousand dollars, to be expended by the Engineer Department.

Submarine mines. Construction, etc.

* * * * *

BOARD OF ORDNANCE AND FORTIFICATION.

Board of Ordnance and Fortification.

To enable the Board to make all needful and proper purchases, experiments, and tests to ascertain, with a view to their utilization by the Government, the most effective guns, small arms, cartridges, projectiles, fuses, explosives, torpedoes, armor plates, and other implements and engines of war, and to purchase or cause to be manufactured, under authority of the Secretary of War, such guns, carriages, armor plates, and other war material as may, in the judgment of the Board, be necessary in the proper discharge of the duty devolved upon it by the Act approved September twenty-second, eighteen hundred and eighty-eight; to pay the salary of the civilian member of the Board of Ordnance and Fortification provided by the Act of February twenty-fourth, eighteen hundred and ninety-one, and for the necessary traveling

Purchases, etc.

Vol. 25, p. 489.

Civilian member.

Vol. 26, p. 769.

expenses of said member when traveling on duty as contemplated in said Act; for the payment of the necessary expenses of the Board, including a per diem allowance to each officer detailed to serve thereon, when employed on duty away from his permanent station, of two dollars and fifty cents a day, and for the test of experimental guns, carriages, and other devices procured in accordance with the recommendation of the Board of Ordnance and Fortification, twenty-five thousand dollars, the expenditure of which shall be made by the several bureaus of the War Department heretofore having jurisdiction of the same, or by the Board itself, as the Secretary of War may direct: *Provided*, That before any money shall be expended in the construction or test of any gun, gun carriage, ammunition, or implements under the supervision of the said Board, the Board shall be satisfied, after due inquiry, that the Government of the United States has a lawful right to use the inventions involved in the construction of such gun, gun carriage, ammunition, or implements, or that the construction or test is made at the request of a person either having such lawful right or authorized to convey the same to the Government.

Per diem.

Tests, etc.

Proviso. Right to use inventions.

That all material purchased under the foregoing provisions of this Act shall be of American manufacture, except in cases when, in the judgment of the Secretary of War, it is to the manifest interest of the United States to make purchases in limited quantities abroad, which material shall be admitted free of duty.

Material to be of American manufacture.

Approved, March 2, 1907.

March 2, 1907. [H. R. 24991.] [Public, No. 168.] Vol. 34, p. 1073.

CHAP. 2509.—An Act Making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums of money be, and are hereby, appropriated, to be paid out of any money in the Treasury not otherwise appropriated, to be immediately available, and to be expended under the direction of the Secretary of War and the supervision of the Chief of Engineers, for the construction, completion, repair, and preservation of the public works hereinafter named:

Rivers and harbors appropriations.

Improving harbor at Cape Porpoise, Maine: Completing improvement in accordance with the report submitted in House Document Numbered One hundred and ninety-one, Fifty-ninth Congress, first session, forty-six thousand dollars.

Cape Porpoise, Me.

Improving Sasanoa River, Maine: Completing improvement in accordance with the report of the Board of Engineers, dated February seventh, nineteen hundred and seven, forty-four thousand dollars.

Sasanoa River, Me.

Improving Penobscot River, at Bangor, Maine: Completing improvement in accordance with the report submitted in House Document Numbered Seven hundred and thirty-nine, Fifty-ninth Congress, first session, one hundred and thirty thousand dollars. Penobscot River, Me.

Improving Kennebec River, Maine, from the mouth to Gardiner, in accordance with the report submitted in House Document Numbered Three hundred and twenty-one, Fifty-ninth Congress, second session, seventy-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred thousand dollars, exclusive of the amount herein appropriated. Kennebec River, Me. *Proviso.* Contracts.

Improving breakwater from Mount Desert to Porcupine Island, Bar Harbor, Maine: Continuing improvement, thirty thousand dollars. Bar Harbor, Me., breakwater.

Improving the channel in the Narrows of Lake Champlain, Vermont and New York: For maintenance, two thousand five hundred dollars. Lake Champlain, Vt. and N. Y.

Improving harbor of refuge at Sandy Bay, Cape Ann, Massachusetts: Continuing improvement, one hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated. Sandy Bay, Cape Ann, Mass. *Proviso.* Contracts.

Improving harbor at Beverly, Massachusetts: Completing improvement in accordance with the report submitted in House Document Numbered Nine hundred and sixteen, Fifty-ninth Congress, first session, thirty-eight thousand five hundred dollars. Beverly, Mass.

Improving harbor at Boston, Massachusetts: For maintenance and general improvement, fifty thousand dollars. Boston, Mass.

Improving thirty-five-foot channel in Boston Harbor, five hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for completing said improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three million eight hundred and ninety-four thousand dollars, exclusive of the amounts herein and heretofore appropriated or heretofore authorized. Thirty-five-foot channel. *Proviso.* Contracts.

Improving harbor at Provincetown, Massachusetts: Continuing improvement and for maintenance, five thousand dollars. Provincetown, Mass.

Improving harbor at Hingham, Massachusetts, by redredging the channel, ten thousand dollars. Hingham, Mass.

Improving Dorchester Bay and Neponset River, Massachusetts: Completing improvement to the Neponset Highway Bridge, as recommended in House Document Dorchester Bay and Neponset River, Mass.

Numbered Eighty-three, Fifty-ninth Congress, second session, one hundred and twenty-five thousand two hundred and thirty-three dollars: *Provided*, That no part of this sum shall be expended until the Secretary of War shall have received satisfactory assurance that the improvement of that portion of the Neponset River described in said House document, which lies above the project herein adopted, shall be made and hereafter maintained by the State of Massachusetts or other agency without expense to the Government of the United States.

Proviso. Contracts.

New Bedford and Fairhaven, Mass.

Improving harbors at New Bedford and Fairhaven, Massachusetts: For improving said harbors in accordance with the report submitted in House Document Numbered Two hundred and seventy-one, Fifty-ninth Congress, second session, one hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred thousand dollars, exclusive of the amount herein appropriated.

Proviso. Contracts.

Nantucket, Mass.

Improving harbor at Nantucket, Massachusetts: Continuing improvement, forty-two thousand five hundred dollars.

Essex River, Mass.

Improving Essex River, Massachusetts: For improving said river by the restoration of the channel, five thousand dollars: *Provided*, That no part of this sum shall be expended unless a further amount of five thousand dollars shall be provided by the State of Massachusetts or other agency, and made subject to the order of the Secretary of War in such manner as he may direct, to be expended upon said project under his direction.

Proviso. Condition.

Mystic and Malden rivers, Mass.

Improving Mystic and Malden rivers, Massachusetts: Continuing improvement and for maintenance, including Mystic River below the mouth of Island End River, sixty thousand dollars.

Weymouth Back River, Mass.

Improving Weymouth Back River, Massachusetts: Completing improvement, nine thousand five hundred dollars.

Connecticut River.

Investigation, etc.

Improving Connecticut River between Hartford, Connecticut, and Holyoke, Massachusetts: For investigation and further examination, as recommended by the Board of Engineers in report submitted in House Document Numbered Three hundred and twenty-three, Fifty-ninth Congress, second session, five thousand dollars.

Newport, R. I.

Improving Newport Harbor, Rhode Island, in accordance with the project reported in House Document Numbered One hundred and twenty-one, Fifty-eighth Congress, second session, eighty-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be required for the completion of the project recommended in House Document Numbered Four hundred and thirty-eight, Fifty-ninth Congress, second session, to be paid for

Proviso. Contracts.

as appropriations may from time to time be made by law, to an amount not exceeding in the aggregate one hundred and sixty-five thousand nine hundred dollars, exclusive of the amounts herein and heretofore appropriated.

Point Judith, R. I.

Improving Point Judith Harbor of Refuge, Rhode Island: One hundred thousand dollars, to be expended upon the easterly or shore arm of the breakwater: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said easterly or shore arm of said breakwater, to be paid for from time to time as appropriations may be made by law, not to exceed in the aggregate one hundred and seventy thousand dollars, exclusive of the amounts herein and heretofore appropriated, and the Secretary of War may cause an examination to be made with a view to determining whether a breakwater on the westerly side of said harbor of refuge is necessary to prevent sand movements, or for the protection of the sheltered area within the same, and also what further improvements, if any, should be made therein.

Proviso. Contracts.

Examination, etc.

Point Judith Pond, R. I.

Improving the entrance to Point Judith Pond, Rhode Island: Continuing improvement and for maintenance, eight thousand dollars, which amount shall be expended for dredging.

Block Island, R. I.

Improving Harbor of Refuge at Block Island, Rhode Island: Continuing improvement and for maintenance, twenty thousand dollars.

Great Salt Pond, Block Island, R. I.

Improving harbor at Great Salt Pond, Block Island, Rhode Island: Continuing improvement, thirty thousand dollars, which amount shall be expended in dredging.

Sakonnet Harbor, R. I.

Improving Sakonnet Harbor, Rhode Island: Completing improvement by removal of rock numbered one, in accordance with the report submitted in House Document Numbered Ninety-nine, Fifty-sixth Congress, second session, ten thousand dollars.

Pawtucket River, R. I.

Improving Pawtucket River, Rhode Island: Completing improvement, one hundred and thirty-five thousand five hundred and eighty-four dollars: *Provided*, That no part of this sum shall be expended unless the further amount of sixty-seven thousand seven hundred and ninety-two dollars shall be provided by the State of Rhode Island or other agency, and made subject to the order of the Secretary of War in such manner as he may direct, to be expended under his direction upon said project for its completion.

Proviso. Condition.

Providence River and Harbor, R. I.

Improving Providence River and harbor, Rhode Island, by dredging to a depth of twenty-five feet for a uniform width easterly from the main ship channel between Long Bed and Kettle Point, in accordance with the plan submitted in House Document Numbered One hundred and eight, Fifty-sixth Congress, first session, ninety thousand seven hundred and fifty dollars.

Pawcatuck River, R. I. and Conn.

Improving Pawcatuck River, Rhode Island and Connecticut: Continuing improvement and for maintenance, thirty-three thousand dollars.

Branford, Conn.

Improving harbor at Branford, Connecticut: Completing improvement and for maintenance, five thousand dollars; and the Secretary of War is authorized, in his discretion, to continue the channel with the dimensions heretofore authorized for the inner harbor through the shoals at its outer end to deep water in the outer channel.

New Haven, Conn.

Improving harbor at New Haven, Connecticut: For maintenance, including channel by way of Oyster Point to Kimberly Avenue Bridge on West River, ten thousand dollars.

Breakwater.

Improving breakwater at New Haven, Connecticut: Continuing improvement, one hundred thousand dollars:

Proviso. Contracts.

Provided, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and fifty thousand dollars in addition to the amounts herein and heretofore appropriated.

Bridgeport, Conn.

Improving harbor at Bridgeport, Connecticut: Continuing improvement in accordance with the plan submitted in House Document Numbered Two hundred and seventy-five, Fifty-ninth Congress, second session, one hundred and thirteen thousand dollars:

Provisos. Contracts.

Provided, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred and fifty thousand dollars, exclusive of sums herein and heretofore appropriated or heretofore authorized:

Limit of operations.

Provided further, That the work shall be limited to the construction of the proposed breakwaters, the dredging to twenty-two feet of the main channel and deep anchorage basins as proposed, and the dredging of an anchorage basin twelve feet in depth and of an area equal to that proposed, to be located northwest of the twenty-two foot anchorage basin.

East and South Norwalk, Conn.

Improving harbors at East Norwalk, South Norwalk, and above the railroad bridge at South Norwalk, Connecticut, in accordance with the report submitted in House Document Numbered Two hundred and sixty-two, Fifty-ninth Congress, second session, excepting therefrom the basin at South Norwalk; completing improvement, sixty-three thousand five hundred dollars.

Saugatuck River and harbors to New York State line.

Improving harbors at Five Mile River, Stamford, Southport, Greenwich, and Westport, Connecticut, and Saugatuck River, Connecticut: Continuing improvement and for maintenance, seventy thousand dollars, from which amount the existing project at Stamford may be completed.

Improving Thames River, Connecticut: Continuing improvement and for maintenance, including the completion of the project submitted in House Document Numbered Two hundred and sixty-five, Fifty-ninth Congress, second session, thirty thousand dollars. Thames River, Conn.

Improving Connecticut River, below Hartford, Connecticut: Continuing improvement and for maintenance, forty thousand dollars. Connecticut River, below Hartford.

Improving Housatonic River, Connecticut: Continuing improvement and for maintenance, twenty thousand dollars. Housatonic River, Conn.

Improving harbor at Port Chester, New York: For the removal of ledges of rock opposite the southerly point of Fox Island and for maintenance, six thousand five hundred dollars. Port Chester, N. Y.

Improving Larchmont Harbor, New York: For removal of ledges adjoining Huron Rock and for maintenance, fourteen thousand dollars. Larchmont, N. Y.

Improving Echo Bay, New York: Completing improvement in accordance with the report submitted in House Document Numbered One hundred and eighty-two, Fifty-ninth Congress, second session, and for maintenance, twelve thousand dollars. Echo Bay, N. Y.

Improving harbors at Port Jefferson, Mattituck, Huntington, Flushing Bay, Canarsie Bay, and Sag Harbor, New York: Continuing improvement and for maintenance, one hundred and twenty-five thousand dollars. Harbors, north shore Long Island, N. Y.

Improving Great South Bay, New York: For maintenance, two thousand dollars. Great South Bay, N. Y.

Improving harbor at Saugerties, New York: Continuing improvement and for maintenance, twenty thousand dollars. Saugerties, N. Y.

Improving harbors at Rondout and Peekskill, New York: Continuing improvement and for maintenance, six thousand dollars. Rondout and Peekskill, N. Y.

Improving New York Harbor: For maintenance, one hundred and twenty-five thousand dollars. New York Harbor.

Improving Ambrose Channel, New York Harbor: The Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said project, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding one million one hundred and forty-eight thousand five hundred and ten dollars, exclusive of amounts heretofore appropriated or heretofore authorized, from which amount, or from any amounts heretofore appropriated or authorized for said project, not exceeding eight hundred thousand dollars may be expended for the construction of two suction dredges: *Provided*, That during the continuance of excavation in the said Ambrose Channel the navigation thereof may be restricted by regulations to be issued by the Secretary of War, limiting the use of said channel to daylight navigation by vessels of twenty-nine feet draft or over.

Ambrose channel, N. Y. Contracts.

Dredges authorized.

Proviso. Restriction of navigation.

Bay Ridge and Red Hook channels, N. Y.

Improving Bay Ridge and Red Hook channels, New York: The Secretary of War may prosecute the improvement in said channels with a view to obtaining a depth of thirty-five feet and subsequently increasing said depth to the full forty feet with a width of twelve hundred feet in accordance with the project adopted in the river and harbor act of eighteen hundred and ninety-nine.

Depth.

Vol. 30, p. 1123.

Coney Island channel, N. Y.

Improving Coney Island Channel, New York Harbor, in accordance with the report submitted in House Document Numbered Four hundred and forty-two, Fifty-ninth Congress, second session: Completing improvement and for maintenance, one hundred and eighty-eight thousand three hundred dollars.

Buffalo, N. Y. Repairing breakwaters.

Improving harbor at Buffalo, New York: For repairing and rebuilding of breakwaters damaged by storm in January, nineteen hundred and seven, three hundred and fifty thousand dollars.

Maintenance of harbor, etc.

Improving harbor at Buffalo, New York: To complete arm of Stony Point breakwater, fifty-two thousand three hundred and thirty-six dollars; to excavate rock shoals at entrance of Buffalo Harbor to a depth of twenty-three feet, fifty-six thousand one hundred dollars; for maintenance of structures, channels, and for dredging at entrance to canals at South Buffalo, in outer harbor, seventy-five thousand dollars; in all, one hundred and eighty-three thousand four hundred and thirty-six dollars.

Black Rock Harbor, N. Y.

Improving Black Rock Harbor and Channel, New York: Continuing improvement, and for the construction of the ship lock, in accordance with the report submitted in House Document Numbered Four hundred and twenty-eight, Fifty-eighth Congress, second session, one million dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one million dollars in addition to the sums herein and heretofore appropriated or heretofore authorized: *And provided further*, That the Secretary of War is authorized to construct the lock of sufficient capacity to admit the largest vessels now in use on the Lakes.

Provisos. Contracts.

Size of locks.

Niagara River, N. Y.

Improving Tonawanda Harbor and Niagara River, New York: For removal of the hulk of a steamer lying with its bow about four hundred feet from the east shore of Grand Island, in the Niagara River, three thousand dollars.

Charlotte, N. Y.

Improving harbor at Charlotte, New York: Continuing improvement and for maintenance, eighty-eight thousand five hundred dollars.

Great Sodus Bay, N. Y.

Improving harbor at Great Sodus Bay, New York: Continuing improvement and for maintenance, fifty thousand dollars.

Pultneyville, N. Y.

Improving harbor at Pultneyville, New York: Continuing improvement and for maintenance, six thousand dollars.

Little Sodus Bay, N. Y.

Improving harbor at Little Sodus Bay, New York: Continuing improvement and for maintenance, seventy-five thousand dollars.

Oswego, N. Y.

Improving harbor at Oswego, New York: Continuing improvement in accordance with plan "a," page six of House Document Numbered Fifty-five, Fifty-eighth Congress, second session, and for maintenance, one hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute such project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred thousand dollars, in addition to the amounts herein and heretofore appropriated.

Proviso. Contracts.

Ogdensburg, N. Y.

Improving harbor at Ogdensburg, New York: Continuing improvement and for maintenance, seventy-five thousand dollars.

Bronx River and East Chester Creek, N. Y.

Improving Bronx River and East Chester Creek, New York: Continuing improvement and for maintenance, twenty-nine thousand dollars, of which six thousand dollars may be expended for completing the improvement of East Chester Creek.

East River and Hell Gate, N. Y.

Improving East River and Hell Gate, New York: Continuing improvement, two hundred and fifty thousand dollars, and a resurvey of said project may be made, including any ledge or ledges near to the westerly shore.

Harlem River, N. Y.

Improving Harlem River, New York: Continuing improvement, one hundred and fifty thousand dollars.

Newtown Creek, N. Y.

Improving Newtown Creek, New York: Completing improvement and for maintenance, five thousand dollars.

Browns Creek, N. Y.

Improving Browns Creek, New York: Continuing improvement and for maintenance, five thousand dollars.

Hudson River, N. Y.

Improving Hudson River, New York: Continuing improvement and for maintenance, two hundred and fifty thousand dollars, of which five thousand dollars may be expended in removing the bar and deepening the channel at the mouth of Schodack Creek.

Wappinger Creek, N. Y.

Improving Wappinger Creek, New York: For maintenance, three thousand dollars.

Tarrytown, N. Y.

Improving harbor at Tarrytown, New York: Completing improvement and for maintenance, sixteen thousand dollars.

Raritan Bay, N. J.

Improving Raritan Bay, New Jersey: For maintenance, twenty-five thousand dollars.

Cold Spring Inlet, N. J.

Improving Cold Spring Inlet, New Jersey, to a depth of fifteen feet, in accordance with the plan printed in House Document Numbered Three hundred and eighty-eight, Fifty-ninth Congress, second session, three hundred and eleven thousand dollars: *Provided*, That the depth may be increased to twenty-five feet in case the local authorities or private persons or corporations shall within

Provisos. Contribution by local authorities, etc.

one year from the date of this Act contribute to the improvement the sum of one hundred thousand dollars, making the sum so contributed subject to the order of the Secretary of War in such manner as he shall direct; and the said Secretary of War may receive and expend upon the improvement to a depth of twenty-five feet the said sum of one hundred thousand dollars so contributed: *Provided further*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate, exclusive of the amount herein appropriated and of any sums contributed from other sources, five hundred and ninety-six thousand dollars in case the improvement be made to a depth of fifteen feet, or nine hundred thousand dollars in case the improvement be made to a depth of twenty-five feet: *Provided further*, That no portion of the funds herein appropriated and authorized shall be expended until the necessary land and right of way for the shore ends of the jetties, for light-houses, for the establishment of a life-saving station, and for a depot of engineer supplies, shall have been deeded to the United States free of cost, and until assurance, satisfactory to the Secretary of War, shall have been given that the plan of the harbor, to be established by private capital inside the entrance, will be modified by increasing the distance between the bulkheads immediately inside the shore end of the jetties in the manner recommended in said House Document Numbered Three hundred and eighty-eight, Fifty-ninth Congress, second session, and that the work proposed by the United States for the entrance channel to this harbor will be supplemented by such expenditure from private or corporate sources as shall make the harbor suitable for commerce and protected from injurious wave action: *And provided further*, That the Secretary of War shall have power to prescribe, regulate, and at any time modify the wharfage charges at this harbor, and no part of this appropriation shall be expended until the Cape May Real Estate Company shall, for itself and its successors and assigns, execute such formal acceptance of this proviso as the Secretary of War may require.

Contracts.

Conditions for lands, etc.

Wharfage charges.

Passaic River, N. J.

Improving Passaic River, New Jersey: Completing improvement and for maintenance under existing project, fifty-three thousand dollars.

Newark Bay and Passaic River, N. J.

Improving channel in Newark Bay and Passaic River, New Jersey, in accordance with the report submitted in House Document Numbered Four hundred and forty-one, Fifty-ninth Congress, second session, two hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work, as may be necessary for the prosecution of said work, to an amount not exceeding in the aggregate six hundred and fifty thousand dollars, to be appropriated

Proviso. Contract.

for from time to time according to law, in addition to the amounts herein and heretofore appropriated.

Improving Woodbridge Creek, New Jersey: Completing improvement and for maintenance, nineteen thousand dollars. Woodbridge Creek, N. J.

Improving Keyport Harbor, Matawan Creek; Raritan, South, and Elizabeth rivers, Shoal Harbor, and Compton Creek, and Cheesequake Creek, New Jersey: Continuing improvement and for maintenance, sixty-eight thousand dollars. Keyport Harbor, etc., N. J.

Improving Shrewsbury River, New Jersey: For maintenance, ten thousand dollars. Shrewsbury River, N. J.

Improving Perriwig Bar, Delaware River, between Trenton and Bordentown, New Jersey, and Pennsylvania: Completing improvement in accordance with the report submitted in House Document Numbered Eight hundred and fifty-two, Fifty-ninth Congress, first session, fifty thousand dollars. Delaware River, Perriwig bar, Pa. and N. J.

Improving Mantua Creek, New Jersey: Continuing improvement, and for maintenance, thirty-four thousand four hundred and fifty dollars, of which a sufficient amount may be applied for the construction of a dike to close the old mouth of said stream. Mantua Creek, N. J.

Improving Alloway Creek, New Jersey: Continuing improvement and for maintenance, five thousand dollars, of which a sufficient amount may be applied for the construction of a cut-off at Fosters Bottle: *Provided*, That no expenditure shall be made thereon until all land needed for such cut-off is deeded to the United States free of expense. Alloway Creek, N. J. *Proviso.* Condition.

Improving Tuckerton Creek, New Jersey: Continuing improvement and for maintenance, twelve thousand dollars. Tuckerton Creek, N. J.

Improving Raccoon Creek, New Jersey: Continuing improvement and for maintenance, fifteen thousand dollars, of which a sufficient amount may be applied for the construction of a cut-off at Molonox Shoal: *Provided*, That no expenditure shall be made thereon until all lands necessary for such cut-off shall be deeded to the United States free of expense. Raccoon Creek, N. J. *Proviso.* Condition.

Improving Salem River, New Jersey: Completing improvement in accordance with the report submitted in House Document Numbered Seventy-eight, Fifty-fifth Congress, first session, twenty-nine thousand dollars. Salem River, N. J.

Improving Cohansey River, New Jersey: Completing improvement in accordance with the report submitted in House Document Numbered Six hundred and forty-five, Fifty-ninth Congress, first session, fifty-five thousand eight hundred dollars. Cohansey River, N. J.

Improving harbor at Pittsburg, Pennsylvania: For maintenance, ten thousand dollars. Pittsburg, Pa.

Improving harbor at Erie, Pennsylvania: Continuing improvement and for maintenance, one hundred and twenty thousand *dollars.* Erie, Pa.

Delaware River, N. J., Pa., and Del.

Improving Delaware River, New Jersey, Pennsylvania, and Delaware: Completing improvement, eight hundred and ninety-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be required for the maintenance of said channel, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding five hundred thousand dollars, exclusive of amounts herein and heretofore appropriated: *Provided further*, That contracts for maintenance shall be limited to work to be done not later than the working season of the year nineteen hundred and nine, and the amount herein authorized shall be available for expenditure in the completion of said project: *And provided further*, That of the amounts herein appropriated and authorized not exceeding two hundred thousand dollars may, in the discretion of the Secretary of War, be expended for widening the said channel at the bends therein, below the city of Philadelphia, with a view to securing, so far as practicable, a channel of equal safety and efficiency in all its parts.

Provisos. Contracts.

Limit of work.

Channel below Philadelphia.

Monongahela River, Pa. Lock and Dam No. 5.

Improving Monongahela River, Pennsylvania: For the construction of Lock and Dam Numbered Five, two hundred and fifty-six thousand and forty-two dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be required for the completion of such project, to be paid for as appropriations may from time to time be made by law, to an amount not to exceed five hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contract.

Allegheny River, Pa. Dams Nos. 2 and 3.

Improving Dam Numbered Three, Allegheny River, Pennsylvania: For the repair and reconstruction of Dam Numbered Three, and for the completion of Dam Numbered Two, two hundred and thirty-five thousand dollars.

Wilmington, Del.

Improving Wilmington Harbor, Delaware: Continuing improvement and for maintenance, seventy-five thousand dollars.

Appoquinimink, Murderkill, and Mispillion rivers, Del.

Improving Appoquinimink, Murderkill, and Mispillion rivers, Delaware: Continuing improvement and for maintenance, fifty-three thousand dollars, of which forty thousand dollars may be expended upon the Mispillion River in accordance with the report submitted in House Document Numbered One hundred and two, Fifty-sixth Congress, second session.

St. Jones River, Del.

Improving Saint Jones River, Delaware: For maintenance, three thousand dollars.

Smyrna River, Del.

Improving Smyrna River, Delaware: For maintenance, two thousand dollars.

Broadkill River, Del.

Improving Broadkill River, Delaware, in accordance with the report submitted in House Document Numbered Two hundred and fourteen, Fifty-ninth Congress, second session: Completing improvement, thirty-three thousand three hundred and thirty dollars.

Improving Broad Creek River, Delaware: For maintenance, one thousand five hundred dollars. Broad Creek River, Del.

Improving Patapsco River and channel to Baltimore, Maryland, five hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for the completion of said project, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding one million seven hundred and fifteen thousand dollars, exclusive of the amounts herein and heretofore appropriated or heretofore authorized. Patapsco River, Baltimore, Md. *Proviso.* Contracts.

Improving harbor of Southwest Baltimore, Maryland: For maintenance, six thousand five hundred dollars. Southwest Baltimore, Md.

Improving harbors at Rockhall, Queenstown, Claiborne, and Cambridge, and Chester, Choptank, Warwick, Pocomoke, La Trappe, and Manokin rivers, and Tyaskin Creek, Maryland: Continuing improvement and for maintenance, sixty thousand dollars, of which amount six thousand five hundred dollars may be expended for the completion of the improvement of Tyaskin Creek, in accordance with the report submitted in House Document Numbered Six hundred and eighty-two, Fifty-ninth Congress, first session. Improving Crisfield Harbor, Maryland, in accordance with the report submitted in House Document Numbered Seven hundred and eighty-three, Fifty-ninth Congress, first session: Completing improvement, thirty-seven thousand seven hundred and seven dollars. Chesapeake Bay, Md. Eastern shore. Crisfield, Md.

Improving Elk River, Maryland: Completing improvement in accordance with the report submitted in House Document Numbered Seven hundred and thirty-eight, Fifty-ninth Congress, first session, and for maintenance, eighteen thousand eight hundred and three dollars. Elk River, Md.

Improving Susquehanna River above and below Havre de Grace, Maryland: Continuing improvement and for maintenance, twenty thousand dollars. Susquehanna River, Md.

Improving Nanticoke River, Delaware and Maryland: Continuing improvement and for maintenance, two thousand dollars. Nanticoke River, Del. and Md.

Improving Wicomico River[a], Maryland: For maintenance, two thousand five hundred dollars. Wicomico River, Md.

Improving Potomac River at Washington, District of Columbia: For maintenance, restoring depth of eight feet in tidal reservoir and constructing reservoir inlet gates, two hundred and fifty-eight thousand dollars. Potomac River, D. C.

Improving Anacostia River, District of Columbia: Continuing improvement, one hundred and twenty-seven thousand dollars. Anacostia River, D. C.

Improving Norfolk Harbor and its approaches, Virginia: Completing improvement, thirty-seven thousand eight hundred and twenty-five dollars. Norfolk, Va.

Improving Norfolk Harbor, Virginia, and its ap-

[a] On the eastern shore.

proaches, from deep water in Hampton Roads to the junction of the eastern and southern branches, in accordance with House Documents Numbered Three hundred and seventy-three and Three hundred and eighty-one, Fifty-ninth Congress, first session, including the removal of shoals at the mouth of the eastern branch, two hundred and eighty-two thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute such project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate eight hundred and fifty thousand dollars, exclusive of the amounts herein appropriated.

Proviso. Contracts.

Hampton Roads, Va.

Improving Hampton Roads, Virginia: For maintenance, twelve thousand five hundred dollars.

Cape Charles City, Va.

Improving harbor at Cape Charles City, Virginia: Continuing improvement and for maintenance, twenty-five thousand dollars.

York, Mattaponi, etc., rivers, Va.

Improving York, Mattaponi, and Pamunky rivers and Occoquan and Carters creeks, Virginia: Continuing improvement and for maintenance, forty-nine thousand dollars, of which amount nineteen thousand dollars may be expended for the removal of the bar at the mouth of Occoquan Creek, in accordance with the report submitted in House Document Numbered One hundred and ninety, Fifty-ninth Congress, first session.

Occoquan Creek, Va.

Nomini Creek, Va.

Improving Nomini Creek, Virginia: Continuing improvement and for maintenance, five thousand dollars.

Rappahannock River, Va.

Improving Rappahannock River, Virginia, in accordance with the modified project: Seventy-seven thousand seven hundred and twenty-nine dollars: *Provided*, That a contract or contracts may be entered into by the Secretary of War for such materials and work as may be necessary to complete said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate ninety thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

James River, Va.

Improving James River, Virginia: Continuing improvement and for maintenance, two hundred thousand dollars.

Nansemond River, Va.

Improving Nansemond River, Virginia: Continuing improvement and for maintenance, five thousand dollars.

Appomattox River, Va.

Improving Appomattox River, Virginia: Completing improvement and for maintenance, fifty thousand dollars, and an examination of the said river may be made for the purpose of determining what improvements should be made or plan adopted for the maintenance of the said channel.

Blackwater River, Va.

Improving Blackwater River, Virginia: Completing improvement in accordance with the report submitted in House Document Numbered One hundred and seventy-seven, Fifty-ninth Congress, first session, and for maintenance, eight thousand dollars.

Improving Big Sandy River and Levisa and Tug forks, West Virginia and Kentucky: Continuing improvement by the construction of Dam Numbered One, Levisa fork, and Dam Numbered One, Tug Fork; one hundred thousand dollars: *Provided*, That the Secretary of War may enter into contract or contracts for such materials and work as may be necessary for the completion of said dams, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and thirty-five thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Big Sandy River, Levisa and Tug forks, W. Va. and Ky.

Proviso. Contracts.

Improving Big Sandy River, West Virginia and Kentucky, by the construction of a steel service bridge at Lock Numbered One, seven thousand dollars.

Big Sandy River. Bridge.

Improving Little Kanawha River, West Virginia: Completing improvement and for maintenance, eighty-one thousand dollars, and the Secretary of War may cause a survey to be made for one lock and dam in said river above the location of existing Lock Numbered Five.

Little Kanawha River, W. Va.

Improving harbor at Beaufort, North Carolina: For maintenance, twenty-two thousand dollars, of which amount so much as may be necessary may, in the discretion of the Secretary of War, be applied to repairing existing jetties at Fort Macon Point and constructing additional jetties and shore protection.

Beaufort, N. C.

Improving waterway from Norfolk, Virginia, to the sounds of North Carolina[a], for maintenance, five thousand dollars.

Waterway, Norfolk to North Carolina sounds.

Improving inland water route from Norfolk, Virginia, to Albemarle Sound, North Carolina, through Currituck Sound, for maintenance, three thousand dollars.

Norfolk to Albemarle Sound.

Improving and constructing inland waterway from Pamlico Sound to Beaufort Inlet, North Carolina, ten feet in depth, in accordance with the report submitted in House Document Numbered Eighty-four, Fifty-ninth Congress, second session, two hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for the completion of said project not exceeding in the aggregate three hundred and fifty thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Pamlico Sound to Beaufort Inlet, N. C.

Proviso. Contracts.

Improving Roanoke River, North Carolina: For maintenance, three thousand dollars.

Roanoke River, N. C.

Improving Meherrin River, North Carolina, from the mouth thereof to Murfreesboro, in accordance with the report submitted in House Document Numbered One hundred and thirty-seven, Fifty-ninth Congress, first session: Completing improvement and for maintenance, six thousand dollars.

Meherrin River, N. C.

Improving Scuppernong River, North Carolina: For maintenance, two thousand dollars.

Scuppernong River, N. C.

---

[a] Via *Pasquotank* River.

Pamlico and Tar rivers, N. C.

Improving Pamlico and Tar rivers, North Carolina: Completing improvement below Washington in accordance with the existing project and above Washington in accordance with the report submitted in House Document Numbered Three hundred and forty-two, Fifty-ninth Congress, second session, and for maintenance, eleven thousand five hundred and sixty-three dollars.

Contentnia Creek, N. C.

Improving Contentnia Creek, North Carolina: For maintenance, two thousand dollars.

Neuse and Trent rivers, N. C.

Vol. 34, p. 1424.

Post, p. 2603.

Improving Neuse and Trent rivers, North Carolina: Continuing improvement and for maintenance, thirty thousand dollars.

Waterway, Newbern to Beaufort, N. C.

Improving waterway between Newbern and Beaufort, North Carolina: For maintenance, two thousand dollars.

Beaufort Inlet, N. C.

Improving Beaufort Inlet, North Carolina: For maintenance, five thousand dollars.

New River, etc., N. C.

Improving New River, North Carolina, including inland waterways between Beaufort Harbor and New River and between New River and Swansboro, North Carolina: Continuing improvement and for maintenance, seventeen thousand dollars.

Northeast, Black, and Cape Fear rivers, N. C.

Improving North East and Black rivers, and Cape Fear River above Wilmington, North Carolina: For maintenance, nine thousand dollars.

Cape Fear River, N. C.

Improving Cape Fear River, at and below Wilmington, North Carolina, in accordance with the modified project submitted in House Document Numbered Five hundred and forty-five, Fifty-ninth Congress, first session: Continuing improvement to such depth in excess of twenty feet as the appropriations for the work may permit, due regard being given to the difference in tidal oscillation at the upper and lower portion of the improvement, one hundred and sixty-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred and fifty thousand dollars, exclusive of the amounts herein and heretofore appropriated or heretofore authorized: *And provided further*, That the balance remaining unexpended of previous appropriations and authorizations for improving Cape Fear River at and below Wilmington, North Carolina, shall be available for the project as herein modified, and so much as may be necessary of the funds available for the improvement may be used in the repair of the New Inlet and Swash Defense dams.

Provisos. Contracts.

Balances available.

Reexamination.

The Secretary of War may cause a reexamination to be made of the Cape Fear River above Wilmington, North Carolina, with a view to reporting what modifications, if any, should be made in the existing project, the expense of which shall be paid from the amount appropriated in section two.

Improving Shallotte River, North Carolina: For maintenance, three thousand dollars. Shallotte River, N. C.

Improving Winyah Bay, South Carolina: For maintenance, thirty thousand dollars. Winyah Bay, S. C.

Improving inland waterway between Charleston Harbor and opposite McClellanville, South Carolina: Completing improvement, seventy-five thousand two hundred and ninety dollars; and the Secretary of War, may extend the said waterway or a branch thereof to Morrisons Landing in McClellanville. Waterway, Charleston and McClellanville, S. C.

Improving harbor at Charleston, South Carolina: For maintenance, twenty-five thousand dollars. Charleston, S. C.

Improving Waccamaw River, North Carolina and South Carolina, and Little Pedee River, South Carolina: Continuing improvement and for maintenance, twenty thousand dollars. Waccamaw and Little Pedee rivers, N.C. and S. C.

Improving Lynch's River and Clarke's Creek, South Carolina, by the removal of logs and snags, two thousand dollars. Lynch River, and Clark Creek, S. C.

Improving Great Pedee River, South Carolina: Continuing improvement and for maintenance, twenty thousand dollars. Great Pedee River, S. C.

Improving Santee, Wateree, and Congaree rivers, and Estherville-Minim Creek Canal, South Carolina: Continuing improvement and for maintenance, one hundred and fifty thousand dollars; and the limits of the improvement of the Congaree River shall be extended to include that part of the said river included in the project from Gervais Street Bridge, Columbia, to Granby, South Carolina. Santee, Wateree, Congaree rivers, etc., S. C.

Improving harbor at Savannah, Georgia: Continuing improvement and for maintenance, according to the plans of the Board of Engineers for Rivers and Harbors, submitted in House Document Numbered One hundred and eighty-one, Fifty-ninth Congress, first session, three hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate seven hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated or heretofore authorized: *Provided further*, That the dredge recommended in the said document to be built shall be of the stationary pumping type and cost not to exceed one hundred and twenty-five thousand dollars: *And provided further*, That three hundred thousand dollars of the amount herein authorized or appropriated, or so much thereof as may be necessary, may be expended in raising, strengthening, or extending the existing jetties, training walls, and other regulating works. Savannah, Ga. *Provisos.* Contracts. Dredge. Existing jetties.

Improving harbor at Brunswick, Georgia, in accordance with the report submitted in House Document Numbered Four hundred and seven, Fifty-ninth Congress, Brunswick, Ga.

first session, one hundred and forty-six thousand six hundred and fifty dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred and fifty thousand dollars exclusive of the amounts herein and heretofore appropriated: *Provided further*, That it shall be the duty of the Chief of Engineers to ascertain if any person or corporation owning, controlling, or using any wharf or wharfage privileges at said harbor discriminates against anyone engaged in the transportation of freight by ship, vessel, or railroad, and whether any such wharf owners or wharfingers refuse to permit any vessels or ships to land at or use said wharves, and to make report thereof to Congress.

Provisos. Contracts.

Discriminations to be investigated.

Cumberland Sound, Ga. and Fla.

Improving Cumberland Sound, Georgia and Florida: Continuing improvement and for maintenance, seventy-five thousand dollars.

Savannah River, Ga. Below Augusta.

Improving Savannah River below Augusta, Georgia: Continuing improvement and for maintenance, thirty thousand dollars.

Above Augusta.

Improving Savannah River above Augusta, Georgia: Continuing improvement and for maintenance, three thousand dollars.

Altamaha, Oconee, and Ocmulgee rivers, Ga.

Improving Altamaha, Oconee, and Ocmulgee rivers, Georgia: Continuing improvement and for maintenance, seventy-five thousand dollars: *Provided*, That twenty-five thousand dollars of said amount may, if necessary, in the discretion of the Secretary of War, be expended upon the Ocmulgee River between the cities of Macon and Hawkinsville, Georgia.

Club and Plantation creeks canal, Ga.

Improving Club and Plantation creeks canal, Georgia, in accordance with House Document Numbered One hundred and fifty-nine, Fifty-eighth Congress, second session, twenty thousand dollars.

Water route, Savannah, Ga., to Fernandina, Fla.

Improving inside water route between Savannah, Georgia, and Fernandina, Florida: Continuing improvement and for maintenance, thirty thousand dollars; and the Secretary of War may cause a resurvey to be made to determine the best route for said waterway.

Skidaway Narrows, Ga.

Improving Skidaway Narrows, Georgia: Completing improvement, and for maintenance, thirty-five thousand dollars.

Flint River, Ga.

Improving Flint River, Georgia: Continuing improvement and for maintenance, twenty-five thousand dollars.

Chattahoochee River, Ga. and Ala.

Improving Chattahoochee River, Georgia and Alabama, below Columbus: Continuing improvement and for maintenance, one hundred and fifty thousand dollars.

Coosa River, Ga. and Ala.

Improving Coosa River, Georgia and Alabama: Continuing improvement and for maintenance, fifty thousand dollars, of which amount, two thousand dollars may be expended, if required, for the care and preservation of the Government plant and property at Wetumpka.

Improving Fernandina Harbor, Florida, in accordance with the report submitted in House Document Numbered Three hundred and eighty-eight, Fifty-ninth Congress, first session, one hundred and fifteen thousand dollars.

Fernandina, Fla.

Improving Biscayne Bay, Florida: With a view to the completion of the project provided for in the Act approved June thirteenth, nineteen hundred and two, entitled "An Act making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," by dredging the portion of the channel extending to the sea from the terminus of the channel to be constructed by the Florida East Coast Railway Company to the depth of eighteen feet, one hundred feet wide, by completing the north jetty now under process of construction and constructing the south jetty, one hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said work, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding one hundred and forty-six thousand dollars, exclusive of the amounts herein and heretofore appropriated: *Provided further*, That nothing contained in this Act shall be so construed as to relieve the said Florida East Coast Railway Company from its obligations under the contract entered into with the United States in accordance with the provisions of said Act approved June thirteenth, nineteen hundred and two.

Biscayne Bay, Fla.
Vol. 32, p. 338.

Provisos.
Contracts.

Florida East Coast Railway Company contract.

Improving harbor at Key West, Florida, and entrance thereto: Continuing improvement and for maintenance, by dredging and work on jetties or by constructing training walls, in the discretion of the Secretary of War, two hundred thousand dollars.

Key West, Fla.

Improving Sarasota Bay, Florida: Continuing improvement from Tampa Bay to Venice, twenty-two thousand five hundred dollars.

Sarasota Bay, Fla.

Improving East Pass and Carrabelle bar and harbor, Florida: Continuing improvement with a view to obtaining a channel eighteen feet deep and one hundred feet wide from the eighteen-foot contour in the outer harbor to a point opposite the beacon situated about one thousand feet up the river from its mouth, with a suitable turning basin, thence ten feet deep and one hundred feet wide to the wharves at Carrabelle, sixty thousand dollars.

East Pass and Carrabelle bar, Fla.

Improving Apalachicola Bay, Florida: Continuing improvement with a view to obtaining a channel across the bar at the mouth of the Apalachicola River not less than one hundred feet wide and ten feet deep at mean low water, and a channel not less than one hundred and fifty feet wide and eighteen feet deep through Link channel and West Pass to the Gulf of Mexico, in accordance with the report submitted in House Document Numbered Four

Apalachicola Bay, Fla.

hundred and twenty-two, Fifty-ninth Congress, first session, eighty-five thousand dollars.

Pensacola, Fla.

Improving harbor at Pensacola, Florida: Continuing improvement and for maintenance, one hundred thousand dollars.

St. Johns River, Fla.

Improving Saint Johns River, Florida: For maintenance, one hundred thousand dollars.

Orange Mills flats.

Improving Saint Johns River at Orange Mills Flats, Florida: Continuing improvement and for maintenance, twenty-five thousand dollars.

Opposite Jacksonville.

Improving Saint Johns River, Florida, opposite the city of Jacksonville: Completing improvement in accordance with the report submitted in House Document Numbered Six hundred and sixty-three, Fifty-ninth Congress, first session, three hundred and seventy-one thousand five hundred dollars.

Volusia bar.

Improving Volusia bar, Florida: For maintenance, two thousand dollars.

Oklawaha River, Fla.

Improving Oklawaha River, Florida: Completing improvement from the mouth to Leesburg, Florida, including Silver Springs Run, in accordance with the report submitted in House Document Numbered Seven hundred and eighty-two, Fifty-ninth Congress, first session, and for maintenance, fifteen thousand dollars.

Indian River, Fla.

Improving Indian River, Florida, between Goat Creek and Jupiter Inlet: Continuing improvement and for maintenance, nine thousand dollars.

Kissimmee River, Fla.

Improving Kissimmee River [a], Florida: Completing improvement and for maintenance, twelve thousand two hundred and twenty-one dollars.

Orange River, etc., Fla.

Improving Orange River, Charlotte Harbor, and Caloosahatchie River, Florida: For maintenance, three thousand dollars.

Crystal River, etc., Fla.

Improving Crystal, Anclote, and Suwanee rivers, Florida: Continuing improvement and for maintenance, twenty-five thousand dollars.

Withlacoochee River, Fla.

Improving Withlacoochee River, Florida, in accordance with the report submitted in House Document Numbered Four hundred and eighty-three, Fifty-ninth Congress, second session, following Route "F," sixty-five thousand four hundred dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and fifty thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

Manatee River, Fla.

Improving Manatee River, Florida: Completing improvement and for maintenance, seventy thousand seven hundred and ten dollars.

---

[a] The adopted project provides for the improvement also of Istokpoga Creek, which empties into Kissimmee River about 10½ miles north of Fort Bassinger.

Improving Apalachicola River, Florida, including the cut-off and lower Chipola River and the upper Chipola River from Mariana to its mouth: Continuing improvement and for maintenance, twenty-five thousand dollars. Apalachicola River, etc., Fla.

Improving Choctawhatchee River, Florida and Alabama, including Cypress Top outlet: Continuing improvement and for maintenance, ten thousand dollars. Choctawhatchee River, Fla. and Ala.

Improving Holmes River, Florida, from Vernon to its mouth: Continuing improvement and for maintenance, two thousand dollars. Holmes River, Fla.

Improving Blackwater River, Florida: Continuing improvement and for maintenance, five thousand dollars. Blackwater River, Fla.

Improving Escambia and Conecuh rivers, Florida and Alabama: Continuing improvement and for maintenance, fifteen thousand dollars. Escambia and Conecuh rivers, Fla. and Ala.

For the removal of water hyacinth from the navigable waters of the State of Florida, so far as it is or may become an obstruction to navigation, fifteen thousand dollars: *Provided*, That no chemical process injurious to cattle which may feed upon the water hyacinth shall be used. Water hyacinth, Fla. Removing. *Proviso.* Restriction.

Improving harbor at Mobile, Alabama: Continuing improvement and for maintenance, in accordance with the recommendation of the Board of Engineers for Rivers and Harbors created by section three of the river and harbor Act of June thirteenth, nineteen hundred and two, in its report printed in House Document Numbered Six hundred and forty-seven, Fifty-ninth Congress, first session, two hundred thousand dollars: *Provided*, That not more than ten thousand dollars of such amount may, in the discretion of the Secretary of War, be used in the removal of dead heads, sunken logs, and other obstructions arising from the freshets on the rivers entering Mobile Bay: *Provided further*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred and sixty thousand dollars, exclusive of the amounts herein and heretofore appropriated: *And provided further*, That so much as may be necessary may be expended in the construction of a dredge for said harbor. Mobile, Ala. Vol. 32, p. 372. *Provisos.* Snagging, etc. Contracts. Dredge authorized.

Improving Mobile bar, Alabama: Continuing improvement and for maintenance, fifty thousand dollars. Mobile bar, Ala.

Improving Alabama River, Alabama: Continuing improvement and for maintenance, two hundred thousand dollars. Alabama River, Ala.

Improving Conecuh River, Alabama, in accordance with the report submitted in House Document Numbered One hundred and fifty-nine, Fifty-ninth Congress, first session: Completing improvement, thirty-one thousand dollars. Conecuh River, Ala.

Improving Black Warrior, Warrior, and Tombigbee rivers, Alabama, by the construction of locks and dams, three hundred and fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or con- Black Warrior, Warrior, and Tombigbee rivers, Ala. *Provisos.* Contracts.

tracts for such materials and work as may be necessary to prosecute said improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one million eight hundred and forty-two thousand dollars, exclusive of the amounts herein and heretofore appropriated or heretofore authorized: *Provided further*, That so much as may be necessary shall be used in the completion of Lock and Dam Numbered One in the Tombigbee River near Demopolis, and Locks and Dams Numbered Two and Three in the Warrior River next above; and in the construction of Lock and Dam Numbered Three in the Tombigbee River and of Locks and Dams Numbered Fourteen, Fifteen, Sixteen, and Seventeen in the Black Warrior River above Tuscaloosa.

Distribution.

Tombigbee River. To Demopolis.

Improving Tombigbee River, Alabama, from the mouth to Demopolis: For maintenance, sixteen thousand dollars.

Demopolis to Columbus.

Improving Tombigbee River, Alabama, from Demopolis, Alabama, to Columbus, Mississippi: For maintenance, fourteen thousand dollars, of which amount two thousand dollars may, in the discretion of the Secretary of War, be expended upon the said river between Columbus and Walkers Bridge.

Horn Island Pass, Miss.

Improving Horn Island Pass, Mississippi: For maintenance, nine thousand dollars.

Biloxi, Miss.

Improving harbor at Biloxi, Mississippi: For maintenance, nine thousand dollars.

Dredge for harbors, Mississippi coast.

Improving harbors on the coast of Mississippi: The Secretary of War may, in his discretion, construct a dredge for use in said harbors and the channels adjacent thereto, at a cost not exceeding two hundred thousand dollars, of which amount, in case said dredge is constructed, twenty-five thousand dollars shall be taken from the appropriation herein for Gulfport Harbor and fifty thousand dollars from the appropriation for Pascagoula River.

Gulfport-Ship Island Harbor channel, etc., and Ship Island Pass, Miss.

Improving anchorage basin at Gulfport and channel therefrom to the anchorage or roadstead at Ship Island; also Ship Island Pass between Ship and Cat islands, Mississippi: Continuing improvement and for maintenance one hundred thousand dollars; and the Secretary of War may annul that portion of the contract entered into February twentieth, nineteen hundred and one, between Major W. T. Rossell, Corps of Engineers, United States Army, on behalf of the United States, and Spencer S. Bullis, relating to maintenance of a channel and anchorage basin in Mississippi Sound between Ship Island and Gulfport, Mississippi, and the amount due the said Spencer S. Bullis, or his assigns, for maintenance shall be reckoned from June fourteenth, nineteen hundred and six, to the date of annulment at the rate of ten thousand dollars per annum.

Contract to be annulled.

Vol. 30, p. 1127.

Vol. 34, p. 833.

Improving Pascagoula River[a], Mississippi: Continuing improvement and for maintenance, two hundred thousand dollars. Pascagoula River, Miss.

Improving Pascagoula[b], Leaf, and Chickasahay rivers, Mississippi: For maintenance, ten thousand dollars. Leaf, Chickasahay, etc., rivers, Miss.

Improving Pearl River, Mississippi, below Rockport: Continuing improvement and for maintenance, thirty thousand dollars. Pearl River, Miss. Below Rockport.

Improving Pearl River, Mississippi, between Edinburg and Jackson: For maintenance, three thousand five hundred dollars. Between Edinburg and Jackson.

Improving Wolf and Jordan rivers, Mississippi, in accordance with the report submitted in House Document Numbered Nine hundred and seventeen, Fifty-ninth Congress, first session: Completing improvement, thirty thousand dollars. Wolf and Jordan rivers, Miss.

Improving Homochitto River, Mississippi: For maintenance, four thousand dollars. Homochitto River, Miss.

Improving Yazoo, Tallahatchie, and Coldwater rivers and Tchula Lake, Mississippi: For maintenance, forty-five thousand dollars. Yazoo River, etc., Miss.

Improving Tallahatchie River, Mississippi, between Batesville and the mouth of the Coldwater River, in accordance with the report submitted in House Document Numbered One hundred and forty-seven, Fifty-ninth Congress, first session, four thousand dollars. Tallahatchie River, Miss.

Improving Big Sunflower River, Mississippi, in accordance with report submitted in House Document Numbered Six hundred and sixty-seven, Fifty-ninth Congress, first session, and continuing improvement under existing project to the mouth of the Hushpucena River, and for maintenance, one hundred thousand dollars. Big Sunflower River, Miss.

Improving South Pass channel of the Mississippi River, Louisiana: For maintenance, fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for the improvement and maintenance of said channel to an amount not exceeding fifty thousand dollars, to be expended during the fiscal year closing June thirtieth, nineteen hundred and nine, both of which amounts shall be in addition to and exclusive of the regular annual appropriation of one hundred thousand dollars for that purpose. South Pass, Mississippi River, La. *Proviso.* Contracts. Vol. 31, p. 585.

Improving South West Pass of the Mississippi River, Louisiana: Continuing improvement, one million dollars: *Provided*, That a contract or contracts may be entered into by the Secretary of War for such materials and work as may be necessary for the completion of said project, to be paid for as appropriations may from time to time be made by law, not exceeding in the aggregate one million Southwest Pass, Mississippi River, La. *Proviso.* Contracts.

[a] From a point on Dog River 3 miles above its mouth to Mississippi Sound.

[b] Above mouth of Dog River.

five hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Calcasieu River, La.

Improving the mouth and passes of Calcasieu River, Louisiana: For maintenance, twenty-five thousand dollars.

Bayou Lafourche, La.

Time for locks, etc., extended.

Vol. 32, p. 378.

Vol. 33, p. 588.

The limit of time fixed by an Act making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes, approved June thirteenth, nineteen hundred and two, for the removal of a temporary dam and the construction of locks [a] in Bayou Lafourche, State of Louisiana, is hereby extended until January first, nineteen hundred and ten.

Bayou Plaquemine, etc., La.

Improving Bayou Plaquemine, Grand River, and Pigeon Bayou, Louisiana: For construction of a dredge and maintenance, one hundred thousand dollars.

Bayou Teche, La.

Improving Bayou Teche, Louisiana: With a view to obtaining a six-foot navigation to Arnaudville, in accordance with the report submitted in House Document Numbered Five hundred and twenty-seven, Fifty-ninth Congress, first session, and for maintenance of the existing project, one hundred and thirty thousand dollars: *Provided*, That this expenditure for a six-foot navigation to Arnaudville shall be contingent upon all lands necessary for lock and dam purposes and canal feeders being deeded to the United States free of cost, and upon the United States being secured against possible claims for damages resulting from the overflow of lands by reason of the lock and dam improvement or from the draining of Spanish Lake.

Proviso. Condition.

Waterway, Franklin to Mermentau, La.

Improving Inland Waterway Channel from Franklin to Mermentau, Louisiana, in accordance with the report submitted in House Document Numbered Six hundred and forty, Fifty-ninth Congress, second session, eighty-nine thousand two hundred and ninety-two dollars, and the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said project, to be paid for as appropriations may from time to time be made by law, not to exceed two hundred thousand dollars in excess of the amount herein appropriated.

Bayou Vermilion, etc.

Improving the channel, bay, and passes of Bayou Vermilion and Mermentau River and tributaries, Louisiana: For maintenance, twenty-five thousand dollars.

Bogue Chitto, etc., La.

Improving Bogue Chitto, Chefuncte River, Bogue Falia, Tickfaw River and tributaries, also Amite River, and Bayou Manchac, Louisiana: For maintenance, thirty-four thousand dollars.

Johnsons Bayou.

Improving Johnsons Bayou, Louisiana: For maintenance, two thousand five hundred dollars.

---

[a] By the Atchafalaya Basin and the Lafourche Basin levee boards.

For the removal of the water hyacinth from the navigable waters in the States of Louisiana and Texas, so far as it is or may become an obstruction to navigation, ten thousand dollars.

Water hyacinth, La. and Tex.

Improving the Red River in the States of Louisiana, Arkansas, Texas, and Oklahoma: For continuing improvement and for maintenance, two hundred and fifty thousand dollars, of which amount one hundred thousand dollars may be expended between Fulton, Arkansas, and Denison, Texas.

Red River, La., Ark., Tex., and Okla.

Improving Bayou Bartholomew, Boeuf River, Tensas River, Bayou Macon, and Bayous D'Arbonne and Corney, Louisiana and Arkansas: For maintenance, seventeen thousand dollars.

Bayou Bartholomew, etc., La. and Ark.

Improving Ouachita and Black rivers, Louisiana and Arkansas: Continuing improvement by the construction of Lock and Dam Numbered Two, near Catahoula Shoals, Louisiana, and Lock and Dam Numbered Eight, near Franklin Shoals, Arkansas, in accordance with the plan in House Document Numbered Four hundred and forty-eight, Fifty-seventh Congress, first session, and for maintenance, two hundred thousand seven hundred and eighty dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the construction of said locks and dams, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred and sixty thousand eight hundred and twenty-three dollars, exclusive of the amounts herein and heretofore appropriated: *Provided further*, That the location of said locks and dams may, in the discretion of the Secretary of War, be changed.

Ouachita and Black rivers, La. and Ark.

Provisos. Contracts.

Location of locks, etc.

Improving Sabine Pass, Texas and Louisiana: Continuing improvement and for maintenance, one hundred and sixty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Sabine Pass, Tex. and La.

Proviso. Contracts.

Improving channel connecting Sabine and Neches rivers with the mouth of Taylors Bayou, Texas. Such portion as may be necessary of any funds heretofore appropriated or authorized for this work, and not required to complete the present adopted project, may, in the discretion of the Secretary of War, be applied to extending the channel at its southern end with a depth of nine feet to a junction with the Port Arthur Ship Canal and to widening the canal in front of Port Arthur.

Channel, Sabine and Neches rivers to Taylors Bayou, Tex.

Port Arthur Canal.

Improving Galveston Harbor, Texas: Continuing improvement by the extension of the jetties and by dredging, in accordance with the report submitted in House Document Numbered Three hundred and forty, Fifty-

Galveston, Tex.

ninth Congress, second session, as modified by the report of the Board of Engineers for Rivers and Harbors in its report of January eleventh, nineteen hundred and seven, and for maintenance, three hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for the further prosecution of the work, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate seven hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated: *Provided further*, That the Secretary of War, in his discretion, may prosecute said improvement by the extension of the existing jetties or by dredging, or by both of said methods.

Provisos. Contracts.

Method of improvement.

Galveston channel, Tex.

Improving Galveston channel, Texas: Continuing improvement, including the extension of channel to Fifty-sixth street, two hundred thousand dollars: *Provided*, That no part of said sum shall be expended until a bond with proper sureties, satisfactory to the Secretary of War, in such amount as he may deem necessary, shall have been furnished, to insure that the city of Galveston will, on or before June thirtieth, nineteen hundred and nine, convey to the United States a good and sufficient title to the point of land known as Pelican Spit and the land adjacent thereto, as described in resolution of the board of commissioners of the city of Galveston, Texas, dated April first, nineteen hundred and five.

Proviso. Condition.

Channel to Texas City, Tex.

Improving channel from Galveston Harbor to Texas City, Texas: For maintenance, sixty thousand dollars.

Brazos River, Tex.

Improving the mouth of the Brazos River, Texas: Continuing improvement and for maintenance, thirty-five thousand dollars, and the Secretary of War may cause an examination to be made of said project with a view to determining what further improvements, if any, should be made thereon.

Aransas Pass, Tex.

Improving harbor at Aransas Pass, Texas: Continuing improvement, in accordance with the plans submitted in its report of December twenty-second, nineteen hundred and six, by the Board of Engineers created by authority of section three of the river and harbor Act of June thirteenth, nineteen hundred and two, two hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred and ninety thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Vol. 32, p. 372.

Proviso. Contracts.

Port Bolivar, Tex.

Improving channel to Port Bolivar, Texas, by obtaining a channel one hundred and fifty feet wide and twenty-five deep, with an increased width in front of the wharf, as set out in House Document Numbered Seven hundred and nineteen, Fifty-ninth Congress, first session, fifty thousand dollars.

Improving West Galveston Bay channel, Texas, and mouths of adjacent streams, including Trinity River, Anahauc Channel, Cedar Bayou, Chocolate Bayou, and Bastrop Bayou: Continuing improvement, fifty thousand dollars.

West Galveston Bay channel, etc., Tex.

Improving inland waterway on the coast of Texas, to be applied to portions as follows, namely: West Galveston Bay and Brazos River Canal, Texas: Improvement in accordance with the report of the Board of Engineers for Rivers and Harbors, of date December twenty-second, nineteen hundred and six (the estimated cost being one hundred and fifty-one thousand five hundred and twenty-nine dollars): Inland waterway channel from Aransas Pass to Pass Cavallo, including the Guadalupe River to Victoria, Texas: Improvement in accordance with the report submitted in House Document Numbered Three hundred and thirty-six, Fifty-ninth Congress, second session; and the report of the Board of Engineers for Rivers and Harbors, of date December twenty-second, nineteen hundred and six (the estimated cost being one hundred and fifty-eight thousand five hundred and fifty dollars). Turtle Cove Channel, from Aransas Pass to Corpus Christi, Texas: Improvement in accordance with the report submitted in House Document Numbered Three hundred and thirty-eight, Fifty-ninth Congress, second session (the estimated cost being one hundred and twenty-three thousand seven hundred and fifty dollars); for all the above, one hundred and thirty-three thousand eight hundred and twenty-nine dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the above projects in accordance with said reports, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred thousand dollars, exclusive of the amount herein and heretofore appropriated.

Inland waterway, Texas coast. Distribution.

Proviso. Contracts.

Improving Galveston ship channel and Buffalo Bayou, Texas: Continuing improvement to a point at or near the head of Long Reach, in accordance with a modification of the original project as recommended in the report of the Board of Engineers for Rivers and Harbors of date December fifteenth, nineteen hundred and four, two hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project as modified by said report, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated: *Provided further*, That fifty thousand dollars of the said cash appropriation may be expended for the restoration of the channel from the foot of Main street, Houston, to the head of Long Reach.

Galveston ship channel, etc., Tex.

Provisos. Contracts.

Channel from Houston.

Brazos River, Tex.

Velasco to Old Washington.

Improving Brazos River, Texas, from Velasco to Old Washington: Continuing improvement, seventy-five thousand dollars.

Old Washington to Waco.

Improving Brazos River, Texas, from Old Washington to Waco: For the construction of the lock and dam at Hidalgo Falls, seventy-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said lock and dam, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and fifty thousand dollars, exclusive of the amount herein appropriated.

Proviso. Contracts.

Trinity River, Tex.

Improving Trinity River, Texas: For maintenance, thirty-five thousand dollars: For construction of locks and dams, as hereinafter mentioned, forty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to construct Lock and Dam Numbered Four in section one in accordance with the report submitted in House Document Numbered Four hundred and nine, Fifty-sixth Congress, first session [a], and also a lock and dam in accordance with said report at Hurricane Shoals, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate the sum of three hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated or authorized.

Proviso. Contracts.

Cypress Bayou, Tex. and La.

Improving Cypress Bayou, Texas and Louisiana: For maintenance, ten thousand dollars.

Sulphur River, Tex. and Ark.

Improving Sulphur River, Texas and Arkansas, in accordance with the report submitted in House Document Numbered Eight hundred and seventy, Fifty-ninth Congress, first session: Completing improvement, thirty-six thousand dollars.

Arkansas River, Ark.

Improving Arkansas River, Arkansas: For maintenance, thirty-five thousand dollars, and the amounts heretofore appropriated to be expended in the vicinity of Red Fork levee or set apart for dredging are hereby made available for the maintenance of this improvement. The Secretary of War may appoint a board to make an examination of said river to Muscogee, Indian Territory, with a view to ascertaining whether any feasible or desirable plan can be devised for the further improvement of the whole of said river to Muscogee or any portion thereof. The said board may, upon the order of the Secretary of War, also make a similar examination of that portion of the Red River which lies between Fulton, Arkansas, and the mouth of the Washita River, Indian Territory, and the expense of such examination shall be apportioned between the funds appropriated for said rivers in such a manner as the Secretary of War may deem equitable, and

Examination for further improvement.

[a] House Doc. No. 118, 58th Cong., 2d sess., is probably intended.

the said board shall also report upon the Arkansas River at Pine Bluff and the White River at Augusta Narrows, to ascertain and report whether the protection of the banks or rectification of the river at the points named is directly and necessarily required in the interests of navigation, and in case a report shall be made to the effect that such rectification is so required in the interest of navigation, the sum of one hundred thousand dollars, which is hereby conditionally appropriated, shall be expended for improvements at the places named, or either of them.

White River, Ark.

Improving White River, Arkansas: Continuing improvement and for maintenance, thirty thousand dollars, of which amount seven thousand five hundred dollars, or so much thereof as may be necessary, may, if directly and necessarily required in the interest of navigation, be used to prevent a cut-off in said river between Choctaw Railway bridge and the town of Devall Bluff, Arkansas.

Upper White River, Ark.

Improving Upper White River, Arkansas: Completing improvement by the construction of Lock and Dam Numbered Three, seventy-three thousand five hundred dollars.

Cache River, Ark.

Improving Cache River, Arkansas: For maintenance, two thousand dollars.

Black and Current rivers, Ark.

Improving Black and Current rivers, Arkansas: For maintenance, eighteen thousand dollars.

St. Francis and L'Anguille rivers, Ark.

Improving Saint Francis and L'Anguille rivers, Arkansas: For maintenance, twelve thousand dollars.

Obion and Forked Deer rivers, Tenn.

Improving Obion and Forked Deer rivers, Tennessee: For maintenance, three thousand dollars.

Cumberland River. Below Nashville, survey, etc.

Improving Cumberland River, Tennessee and Kentucky, below Nashville: The Secretary of War may cause a survey to be made with a view to the improvement by locks and dams of that portion of the river heretofore surveyed in which no locks and dams have been constructed.

Above Nashville.

Improving Cumberland River, Tennessee, above Nashville, in accordance with the report of the Board of Engineers made in House Document Numbered Six hundred and ninety-nine, Fifty-ninth Congress, first session: Continuing improvement of Locks and Dams Numbered Three, Four, Five, Six, and Seven, one hundred and fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for the completion of said project as recommended to an amount not exceeding in the aggregate four hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

Caney Fork River, Tenn.

Improving Caney Fork River, Tennessee: For maintenance, three thousand dollars.

Tennessee River. Above Chattanooga, Tenn.

Improving Tennessee River, Tennessee, above Chattanooga: Continuing improvement and for maintenance, one hundred and five thousand dollars, of which amount one thousand dollars may, in the discretion of the Secretary of War, be expended for maintenance in the Little Tennessee River.

Chattanooga to Riverton, Ala.

Improving Tennessee River, Tennessee and Alabama, from Chattanooga, Tennessee, to Riverton, Alabama: Continuing improvement by open-channel work to secure a depth of five feet at low water, in accordance with the project submitted in House Document Numbered Fifty, Fifty-seventh Congress, first session, two hundred and five thousand dollars, of which amount fifteen thousand dollars may, if required, be expended in that portion between Hobbs Island and Guntersville.

Hales bar, Tenn.

Improving Tennessee River at Hales bar, Tennessee: Completing improvement, sixty-two thousand nine hundred and seventy dollars.

Colbert and Bee Tree shoals, Ala.

Improving Tennessee River at Colbert and Bee Tree shoals, Alabama: Continuing improvement, two hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for the completion of said project, to an amount not exceeding two hundred and thirteen thousand dollars, exclusive of the amounts herein and heretofore appropriated or authorized. And the Secretary of War may appoint a Board of Engineers whose duty it shall be to examine the present condition of the United States canal and the Tennessee River from the head of Elk River Shoals to the Florence Railway bridge in the State of Alabama, with a view to permitting the improvement of the above-described stretch of said river by private or corporate agency in conjunction with the development of water power by means of not more than three locks and dams; and the said Board may examine any plans presented by such agency and shall report whether the same, if constructed, can, without injury to navigation, or with advantage thereto, be used to develop water power, and what portion, if any, of the expense of the work should be borne by the United States; and such Board shall report its findings not later than the first Monday in December, nineteen hundred and seven, and until such Board shall make its report and action shall be taken thereon by Congress no permits shall be issued under the provisions of the Act approved March sixth, nineteen hundred and six, entitled "An Act to authorize the construction of dams and power stations on the Tennessee River at Muscle Shoals, Alabama."

Proviso. Contract.

Board to examine conditions, etc.

Report.

Muscle shoals, permits withheld.

Vol. 34, p. 52.

Below Riverton.

Improving Tennessee River, Tennessee and Kentucky, below Riverton: Continuing improvement and for maintenance, forty thousand dollars.

French Broad and Little Pigeon rivers, Tenn.

Improving French Broad and Little Pigeon rivers, Tennessee: Continuing improvement and for maintenance, two thousand dollars.

Clinch, Hiwassee, and Holston rivers, Tenn.

Improving Clinch, Hiwassee, and Holston rivers, Tennessee: Completing improvement and for maintenance, fifty-six thousand six hundred and twenty-five dollars.

Kentucky River, Ky.

Kentucky River, Kentucky: Continuing improvement by the construction of Locks and Dams Numbered Twelve and Thirteen, one hundred thousand dollars:

Provided, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the work of constructing said locks and dams, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate four hundred and twenty thousand dollars, exclusive of the amounts herein and heretofore appropriated or heretofore authorized.

Proviso. Contracts.

Improving harbor at Port Clinton, Ohio: For maintenance, three thousand dollars.

Port Clinton, Ohio.

Improving harbor at Sandusky, Ohio: Continuing improvement and for maintenance, one hundred and twenty-five thousand dollars: *Provided*, That there shall be restored to the adopted project, and shall form a part of it, the rock dredging omitted from the said project in the river and harbor Act approved March third, nineteen hundred and five.

Sandusky, Ohio.

Proviso. Rock dredging restored. Vol. 33, p. 1134.

Improving harbor at Huron, Ohio: For maintenance, sixteen thousand dollars.

Huron, Ohio.

Improving harbor at Vermilion, Ohio: For maintenance, fifteen thousand dollars.

Vermilion, Ohio.

Improving harbor at Lorain, Ohio, thirty thousand dollars, of which amount not to exceed fifteen thousand dollars may be expended for dredging on the easterly side of Black River from the inner end of the easterly Government pier to East Erie Avenue Bridge.

Lorain, Ohio.

Improving harbor at Cleveland, Ohio: Continuing improvement and for maintenance, two hundred and twenty-three thousand dollars, of which amount ninety-eight thousand dollars may be expended for wharf room for the storage of material and plant or other Government property, in accordance with the recommendation contained in the report submitted in House Document Numbered Two hundred and seventy, Fifty-ninth Congress, second session: *Provided*, That no part of said sum of ninety-eight thousand dollars shall be expended for such wharf room unless terms can be made with the Cleveland Yacht Club in accordance with the recommendations of the Board of Engineers for Rivers and Harbors as set forth in said document: *Provided further*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for the prosecution of the project submitted in House Document Numbered One hundred and eighteen, Fifty-sixth Congress, second session, and heretofore adopted, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding nine hundred thousand dollars in addition to the amounts heretofore appropriated or authorized.

Cleveland, Ohio.

Provisos. Condition on wharf room.

Contracts.

Improving harbor at Fairport, Ohio: Continuing improvement and for maintenance, one hundred thousand dollars.

Fairport, Ohio.

Improving harbor at Ashtabula, Ohio: For maintenance, twenty thousand dollars.

Ashtabula, Ohio.

Conneaut, Ohio.

Improving harbor at Conneaut, Ohio: For maintenance, twenty thousand dollars.

Muskingum River, Ohio.

Improving Muskingum River, Ohio: Completing improvement by the construction of Lock and Dam Numbered Eleven, forty-eight thousand dollars.

Ohio River. General improvement.

Improving Ohio River: General improvement, four hundred and fifty thousand dollars: *Provided*, That so much of this amount as may be necessary may, in the discretion of the Secretary of War, be expended in the construction of a dredging plant.

Proviso.

Dredging plant.

Lock No. 6, Pa.

Improving Ohio River, in the State of Pennsylvania, by the lowering of the sill of Lock Numbered Six, so as to give a navigable passageway of nine feet through said lock, seventy thousand dollars.

Lock and Dam No. 8.

Improving Lock and Dam Numbered Eight in Ohio River, in the States of Ohio and West Virginia, two hundred and fifty-one thousand eight hundred and forty-five dollars; and the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for the completion of said lock and dam, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate five hundred thousand dollars in excess of the amounts herein and heretofore appropriated or heretofore authorized: *Provided*, That the said lock and dam shall be constructed with a view to a navigable depth of nine feet.

Contracts.

Proviso.

Depth.

Lock and Dam No. 11.

Improving Lock and Dam Numbered Eleven in the States of Ohio and West Virginia, one hundred and ninety-eight thousand three hundred and forty-three dollars; and the Secretary of War may enter into a contract or contracts for such materials and work as are necessary to complete said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate five hundred thousand dollars in excess of the amounts herein and heretofore appropriated or heretofore authorized: *Provided*, That the said lock and dam shall be constructed with a view to a navigable depth of nine feet.

Contracts.

Proviso.

Depth.

Locks and Dams Nos. 13 and 18.

Improving Locks and Dams Numbered Thirteen and Eighteen on Ohio River in the States of Ohio and West Virginia: Continuing improvement, one hundred and seventy-four thousand seven hundred and seventy-eight dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for the completion of each of said locks and dams, making separate contracts for said locks and dams, if desirable, to be paid for as appropriations may from time to time be made by law, to an amount not to exceed in the aggregate four hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated or heretofore authorized: *Provided*, That the said locks and dams shall be constructed with a view to a navigable depth of nine feet.

Provisos. Contracts.

Depth.

Improving Lock and Dam Numbered Twenty-six in the Ohio River, in the States of Ohio and West Virginia, one hundred thousand dollars, and the provisions of the river and harbor Act approved March third, nineteen hundred and five, appropriating one hundred and thirty-five thousand dollars in the aggregate for Locks and Dams Numbered Nineteen and Twenty-six are hereby repealed, and the said amount is made available for the construction of said Lock and Dam Numbered Twenty-six: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said lock and dam, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate nine hundred and sixty-five thousand dollars, in addition to the amounts herein appropriated or made available: *Provided*, That said lock and dam shall be constructed with a view to a navigable depth of nine feet.

Lock and Dam No. 26.

Repeal of amount for Nos. 19 and 26. Vol. 33, p. 1136.

Provisos. Contracts.

Depth.

Improving Lock and Dam Numbered Nineteen in the Ohio River, in the States of Ohio and West Virginia, two hundred thousand dollars.

Lock and Dam No. 19.

Improving Lock and Dam Numbered Thirty-seven, in the States of Ohio and Kentucky: The Secretary of War is authorized to enter into a contract or contracts for such materials and work as may be necessary for the completion of said lock and dam, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding one hundred thousand dollars in excess of the amounts herein and heretofore appropriated or heretofore authorized: *Provided*, That the said lock and dam shall be constructed with a view to a navigable depth of nine feet.

Lock and Dam No. 37. Contracts.

Proviso. Depth.

Improving the Ohio River at Louisville, Kentucky: By raising the dam so as to give a minimum depth of nine feet upstream to Madison, Indiana, and a minimum depth of six feet on the lower miter sill at Lock Numbered One, Kentucky River, two hundred and seventy-one thousand dollars.

Louisville, Ky. Raising dam.

Improving the Ohio River at Louisville, Kentucky: By the removal of rocks in the channel of said river near to the falls, forty-three thousand dollars.

Removing rocks.

Improving the great Miami embankment of Ohio River east of Lawrenceburg, Indiana; repairing damage caused by the recent flood of the Ohio River and tributaries, twenty thousand dollars, if such repair shall be directly and necessarily required in the interest of navigation.

Miami embankment.

Improving harbor at Ontonagon, Michigan: Continuing improvement and for maintenance, five thousand dollars.

Ontonagon, Mich.

Improving harbor at Marquette, Michigan: Continuing improvement and for maintenance, thirty thousand dollars.

Marquette, Mich.

Grand Marais, Mich.

Improving harbor at Grand Marais, Michigan, harbor of refuge: Continuing improvement and for maintenance, thirty thousand dollars.

Manistique, Mich.

Improving Manistique Harbor, Michigan: Continuing improvement and for maintenance, twenty-five thousand dollars, to be expended by the Secretary of War upon the present project or any modification thereof.

Menominee River and Harbor, Mich. and Wis.

Improving Menominee Harbor and River, Michigan and Wisconsin: For maintenance, five thousand dollars.

St. Joseph Harbor and River, Mich.

Improving harbor at Saint Joseph and Saint Joseph River, Michigan: For maintenance, sixteen thousand dollars.

South Haven, Mich.

Improving harbor at South Haven, Michigan: Continuing improvement and for maintenance, forty thousand dollars; and the Secretary of War is authorized to expend any portion of this sum or of the sums heretofore appropriated upon the work of improvement where dock lines have already been established and suitable bulkheads built, but no portion of this or other appropriations shall be used (except for the maintenance of existing channels) where proper dock lines have not been established and suitable bulkheads built along these lines by the city of South Haven or by the riparian owners and the property lying on the channel side of these dock lines shall have been deeded to the United States free of cost, pursuant to the plan of improvement heretofore adopted.

Saugatuck, and Kalamazoo River, Mich.

Improving Saugatuck Harbor and Kalamazoo River, Michigan: Continuing improvement and for maintenance, seventy-five thousand dollars; and the Secretary of War is authorized to maintain a harbor channel of sufficient depth to allow the free use of the Government dredge Gillespie.

Holland, Mich.

Improving Holland Harbor, Michigan: Completing improvement and for maintenance, one hundred and thirty-eight thousand four hundred and fifty-two dollars.

Grand Haven, Mich.

Improving Grand Haven Harbor, Michigan: Continuing improvement and for maintenance, fifty thousand dollars.

Muskegon, Mich.

Improving harbor at Muskegon, Michigan: Continuing improvement and for maintenance, seventy-five thousand dollars.

Pentwater and White Lake, Mich.

Improving harbor at Pentwater and White Lake, Michigan: For maintenance, twenty thousand dollars; and the Secretary of War is authorized to dredge the channel at Pentwater to the depth of sixteen feet and to dredge the channel at White Lake to sufficient depth to allow the free use of the Government dredge Gillespie.

Ludington, Mich.

For maintaining and improving the harbor at Ludington, Michigan, in accordance with the report submitted in House Document Numbered Sixty-two, Fifty-ninth Congress, first session, one hundred thousand dollars:

Proviso. Contracts.

Provided, That the Secretary of War may enter into a contract or contracts for such material and work as may

be necessary to complete said improvement according to the plan proposed in said House document, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate seven hundred and thirty-nine thousand and eighty-seven dollars, exclusive of the amounts herein and heretofore appropriated.

Manistee, Mich.

Improving harbor at Manistee, Michigan: For maintenance and improvement in accordance with the report submitted in House Document Numbered Five hundred and eleven, Fifty-ninth Congress, first session, twenty-five thousand dollars.

Portage Lake, Mich.

Improving harbor of refuge at Portage Lake, Manistee County, Michigan: For maintenance, ten thousand dollars.

Arcadia, Mich.

Improving harbor at Arcadia, Michigan: For maintenance, six thousand dollars.

Frankfort, Mich.

Improving harbor at Frankfort, Michigan: Continuing improvement and for maintenance, twenty thousand dollars.

Charlevoix and Pine Lake, Mich.

Improving harbor at Charlevoix and entrance to Pine Lake, Michigan: Continuing improvement and for maintenance, twenty thousand dollars.

Petoskey, Mich.

Improving harbor at Petoskey, Michigan: Continuing improvement and for maintenance, seventeen thousand five hundred dollars.

Cheboygan, Mich.

Improving harbor at Cheboygan, Michigan: Completing improvement and for maintenance in accordance with the report submitted in House Document Numbered Five hundred and thirty-seven, Fifty-ninth Congress, first session, fifteen thousand dollars.

Alpena, Mich.

Improving Alpena (Thunder Bay River) Harbor, Michigan: For maintenance, four thousand dollars.

Harbor Beach, Mich.

Improving harbor of refuge at Harbor Beach, Michigan: Continuing improvement and for maintenance, one hundred and fifty thousand dollars.

Grand River, Mich.

Improving Grand River, Michigan: Continuing improvement and for maintenance, eighty-eight thousand dollars. And the Secretary of War may cause an examination of the river to be made by a board of engineer officers with a view to the regulation of the floods in the interest of navigation.

Examination of floods.

Saginaw River, Mich.

Improving Saginaw River, Michigan: Continuing improvement and for maintenance, seventy-five thousand dollars.

Sebewaing River, Mich.

Improving Sebewaing River, Michigan: For maintenance, two thousand dollars.

Black and Rouge rivers, and Monroe, Mich.

Improving mouth of Black River, Rouge River, and Monroe Harbor, Michigan: Continuing improvement and for maintenance, twelve thousand dollars, of which amount six thousand five hundred and seventy-five dollars may be expended for the completion and maintenance of the project for Rouge River in accordance with report submitted in House Document Numbered Two hundred and eighty-nine, Fifty-ninth Congress, first session.

Port Huron, Mich.

Improving Black River at Port Huron, Michigan: Continuing improvement and for maintenance, six thousand dollars.

Clinton River, Mich.

Improving Clinton River, Michigan: For maintenance, two thousand five hundred dollars.

Detroit River, Mich.

Improving Detroit River: Continuing improvement and for maintenance, one hundred and fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and fifty thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

Plan "B."

Improving Detroit River in accordance with plan "B," as set forth in House Document Numbered Two hundred and sixty-six, Fifty-ninth Congress, second session, two million dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such material and work as may be necessary to complete said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate four million six hundred and seventy thousand nine hundred and fifty dollars, exclusive of the amounts herein appropriated.

Proviso. Contracts.

St. Marys River, Mich.

Improving Saint Marys River at the Falls, Michigan: For the construction of a new lock, with a separate canal, in accordance with plan "Three," set forth in House Document Numbered Three hundred and thirty-three, Fifty-ninth Congress, second session, one million two hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary for the construction of said lock and canal, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate five million dollars, exclusive of the amounts herein and heretofore appropriated or heretofore authorized.

New lock, etc.

Proviso. Contracts.

Immediate progress.

And it is further provided, That the work of improvement shall proceed without delay by reason of conflicting or other claims of title or interests and without prejudice to any pending litigation in reference thereto.

Acquiring necessary lands.

And all lands and waters north of the present Saint Marys Falls ship canal throughout its length, and lying between said ship canal and the international boundary line, needed in connection with the execution of this project, or any project heretofore adopted by Congress, for improving Saint Marys River at the falls, aside from any lands owned by the United States, all of which are hereby made available for said project, shall be acquired in the following manner, and under the following conditions:

Purchase.

The Secretary of War may, in his discretion, enter into negotiations with any persons or corporations claiming title to any portion of the land or waters required for the construction of the said canal, and may acquire title to

such portions of such river or lands as may be required for its construction and operation, but any agreement made by him shall be without prejudice to any claim of title by the United States and without the grant of any rights or privileges in said river or lands therein which shall create a right to compensation in case any further portion of said river or said lands therein between the canal herein provided for and the international boundary line shall be hereafter required for purposes of navigation.

If such lands and waters can not be obtained in the manner and under the conditions above set forth the same shall be acquired as follows:

Condemnation proceedings.

The Secretary of War may cause proceedings in condemnation to be prosecuted under existing law, or a copy of the said plan numbered three, on a large scale, shall be prepared and exhibited in the office of the United States engineer at Sault Sainte Marie, and the Attorney-General shall proceed to ascertain the owners or claimants of the premises embraced therein, and shall cause to be published for the space of thirty days, in one or more daily newspapers in the city of Sault Sainte Marie, that the same has been taken for the uses mentioned in this Act, and notifying all claimants to any portion of said premises to file, within its period of publication, in the Department of Justice, a description of the tract or parcel claimed and a statement of its value as estimated by the claimant. On application of the Attorney-General, the presiding judge of the circuit court of appeals of the United States for the sixth circuit shall appoint three persons, not in the employ of the Government or related to or in any manner connected with the claimants, to act as appraisers, whose duty it shall be, upon receiving from the Attorney-General a description of any tract or parcel, the ownership of which is claimed separately, to fairly and justly value the same, and report such valuation to the Attorney-General, who thereupon shall, upon being satisfied as to the title of the same, cause to be offered to the owner or owners the amount fixed by the appraisers as the value thereof; and if the offer be accepted, then, upon the execution of a deed to the United States in form satisfactory to the Attorney-General, the Secretary of War shall pay the amount to such owner or owners from the appropriation made therefor in this Act.

Advertisement.

Appointment of appraisers.

Report.

Payment to owner.

Present value only to be considered.

In making the valuation the appraisers shall only consider the present value of the land or property acquired without reference to its value for the uses for which it is taken under the provisions of this Act.

Pay of appraisers.

The appraisers shall each receive for their services five dollars for each day's actual service in making the said appraisements.

Court of Claims to adjudicate damages, etc.

Any person or corporation having any estate or interest in the premises, who shall for any reason not have been tendered payment therefor as above provided, or who shall decline to accept the amount tendered therefor,

may, at any time within one year from the publication of notice by the Attorney-General as above provided, file a petition in the Court of Claims of the United States setting forth his right or title and the amount claimed by him as damages for the property taken; and the court shall hear and adjudicate such claims in the same manner as other claims against the United States are now by law directed to be heard and adjudicated therein: *Provided*, That the court shall make such special rules in respect to such cases as shall secure their hearing and adjudication with the least possible delay.

Proviso. Advance of cases.

Judgments in favor of such claimants shall be paid as other judgments of said court are now directed to be paid; and any claimant to whom a tender shall have been made, as hereinbefore authorized, and who shall decline to accept the same, shall, unless he recover an amount greater than so tendered, be taxed with the entire cost of the proceeding. All claims on account of ownership of any interest in said premises shall, unless petition for the recovery thereof be filed within one year from the date of the first publication of notice by the Attorney-General as above directed, be forever barred: *Provided*, That owners or claimants laboring under any of the disabilities defined in the statute of limitations of the State of Michigan may file a petition at any time within one year from the removal of the disability. Upon the publication of the notice, as above directed, the Secretary of War may take possession of the premises embraced in said plan numbered three, and proceed with the construction herein authorized; and upon payment being made therefor, or without payment, upon the expiration of the time as above limited, without filing the petition, absolute title to the premises shall vest in the United States, and no permits shall be granted by the Secretary of War or other official of the United States granting the right to occupy any portion of the land or waters of Saint Marys River in the locality for said ship canal herein provided for, or between the same and the international boundary line except upon the express condition, accepted by the grantee therein, to the effect that the erection of structures or the utilization of water power shall create no rights against the United States in case the whole or any part of the said river or the lands therein is required for the purposes of navigation, and further, that such structures or rights so granted shall be surrendered to the United States without cost when so required for purposes of navigation aforesaid, and any and all rights under any permits or licenses heretofore granted shall be deemed to be revoked unless such permits or licenses are reissued upon the terms that further improvements and expenditures shall entitle the licensee to no greater consideration than such licensees are now entitled to, if any; but nothing herein contained shall be held to imply that any right

Judgments.

Costs.

Limit of actions.

Proviso. Disabilities of owners.

Construction to proceed on publication of notice.

Title to vest in the United States.

Permits.

Conditions, etc.

now exists to compensation on account of expenditures made or alleged claims under licenses heretofore granted.

Michigan-Lake Superior Power Company. Vol. 32, p. 361.

The Secretary of War may acquire lands for the location of remedial or compensating works to the extent required to enable the Michigan-Lake Superior Power Company to comply with the provisions of the river and harbor Act of nineteen hundred and two, but such lands, if so acquired, shall be obtained without expense to the United States.

Kenosha, Wis.

Improving harbor at Kenosha, Wisconsin: For maintenance and for improving said harbor in accordance with the report submitted in House Document Numbered Sixty-two, Fifty-ninth Congress, first session, twenty-two thousand dollars.

Racine, Wis.

Improving harbor at Racine, Wisconsin: For maintenance and for improving said harbor in accordance with the report submitted in House Document Numbered Sixty-two, Fifty-ninth Congress, first session, fifty thousand dollars.

Milwaukee, Wis.

Improving harbor at Milwaukee, Wisconsin, including harbor of refuge: Continuing improvement and for maintenance, including an extension of one thousand feet to and the repair and rebuilding of the breakwater belonging to the harbor of refuge, and the rebuilding of the south pier of the harbor entrance, two hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete such project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred and ninety-two thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

Sheboygan, Wis.

Improving harbor at Sheboygan, Wisconsin: For maintenance and for improving said harbor in accordance with the report submitted in House Document Numbered Sixty-two, Fifty-ninth Congress, first session, forty thousand dollars.

Manitowoc, Wis.

Improving harbor at Manitowoc, Wisconsin: For maintenance and for improving said harbor in accordance with the report submitted in House Document Numbered Sixty-two, Fifty-ninth Congress, first session, as modified by the Board of Engineers for Rivers and Harbors, one hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred and seventy-six thousand dollars, exclusive of the amounts herein or heretofore appropriated; and the unexpended balance of appropriations heretofore made for said harbor is hereby authorized to be expended in said improvement.

Proviso. Contracts.

Two Rivers, Wis.

Improving harbor at Two Rivers, Wisconsin: For maintenance and for improving said harbor in accordance with

plan "A" of the report submitted in House Document Numbered Seven hundred and thirty, Fifty-ninth Congress, first session, as modified so as to provide for the construction of the north stilling basin and the creation of a sixteen-foot channel, ninety thousand dollars: *Provided*, That no part of said amount shall be expended for the construction of said stilling basin until the title to the land required for said stilling basin shall have been properly and legally conveyed to the United States Government.

Proviso. Condition.

Kewaunee, Wis.

Improving harbor at Kewaunee, Wisconsin: For maintenance, five thousand dollars.

Algoma, Wis. Maintenance.

Improving harbor at Algoma (Ahnapee), Wisconsin: For maintenance, three thousand dollars.

Outer harbor.

Improving harbor at Algoma (Ahnapee), Wisconsin, by the construction of an outer harbor with a depth of sixteen feet of water, forty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete such project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

Sturgeon Bay and Lake Michigan Ship Canal. Vol. 33, p. 1139.

Improving Sturgeon Bay and Lake Michigan Ship Canal, and harbor of refuge connected therewith; of the amount appropriated for this improvement in the Act approved March third, nineteen hundred and five, twenty thousand dollars, or so much thereof as may be necessary, may be expended by the Secretary of War for the maintenance of said canal and harbor of refuge, including dredging near Hills Point. And the Secretary of War is hereby authorized and directed to complete said improvement by dredging and by widening the canal in the vicinity of the bridge across said canal at the city of Sturgeon Bay.

Green Bay, Wis.

Improving harbor at Green Bay, Wisconsin: For maintenance, five thousand dollars.

Ashland, Wis.

Improving harbor at Ashland, Wisconsin: Continuing improvement and for maintenance, ninety thousand dollars.

Port Wing, Wis.

Improving harbor at Port Wing, Wisconsin: Continuing improvement and for maintenance, two thousand dollars.

Fox River, etc., Wis.

Improving Fox River, Wisconsin: Continuing improvement and for maintenance, including the maintenance of the harbors at Stockbridge, Calumet, and Fond du Lac, on Lake Winnebago, thirty-five thousand dollars, of which amount five thousand dollars, or so much thereof as may be necessary, shall be used for dredging and otherwise improving the harbor at Brothertown, on the east shore of Lake Winnebago, Wisconsin.

St. Croix River, Minn. and Wis.

Improving Saint Croix River, Minnesota and Wisconsin: For maintenance, four thousand dollars.

Improving harbor at Grand Marais, Minnesota: For maintenance, five thousand dollars. Grand Marais, Minn.

Improving harbor at Agate Bay, Minnesota: For maintenance, four thousand dollars. Agate Bay, Minn.

Improving harbor at Duluth, Minnesota, and Superior, Wisconsin: Continuing improvement and for maintenance, including additional dredging near the draw span of the Northern Pacific Railroad bridge, seven hundred and twenty-five thousand dollars, of which amount three hundred thousand dollars shall be expended upon the Superior Entry, the plan of which the Secretary of War may modify and enlarge in accordance with the report submitted in House Document Numbered Eighty-two, Fifty-ninth Congress, second session, and the Secretary of War may appoint a board to make a reexamination and survey of the Duluth Harbor and entrance thereto with a view to ascertaining the best method for improving the same, either by the extension of the existing piers, the widening of the channel, the construction of one or more breakwaters, and the enlargement of the inner basin in the interests of commerce, and in order to afford a safer entrance to said harbor in times of storm, and better protection to shipping and property within said harbor; also with a view to ascertaining the advisability of constructing a new entrance to the Duluth Harbor basin of a width suitable for the needs of commerce, not exceeding one thousand feet, and the protection of the same by either an outer or inner breakwater, or both, such new entrance to be located southward from the present Duluth entrance and so as to cause the least practicable interference with the waters of the Saint Louis River, together with the probable effect of such entrance upon the property within said harbor. Duluth, Minn., and Superior, Wis. Reexamination, etc.

Improving Minnesota River, Minnesota: For maintenance, two thousand dollars. Minnesota River, Minn.

Improving Red River of the North, Minnesota and North Dakota: For maintenance, fifteen thousand dollars. Red River of the North, Minn. and N. Dak.

Improving harbor at Michigan City, Indiana: Continuing improvement and for maintenance, sixty thousand dollars. Michigan City, Ind.

Improving harbor at Waukegan, Illinois: Continuing improvement and for maintenance, fifty thousand dollars. Waukegan, Ill.

Improving Chicago Harbor, Illinois: Continuing improvement and for maintenance, two hundred and fifty thousand dollars. Chicago, Ill.

Improving harbor at Calumet, Illinois: For maintenance, twenty thousand dollars. Calumet, Ill.

Improving Chicago River, Illinois: Continuing improvement and for maintenance, three hundred thousand dollars. Chicago River, Ill.

Improving Calumet River, Illinois and Indiana: Completing improvement and for maintenance, one hundred and ninety-one thousand five hundred dollars: *Provided*, Calumet River, Ind. and Ill.

Proviso. Contracts.

That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and seventy thousand dollars, exclusive of the amounts herein or heretofore appropriated.

Illinois River, Ill.

Improving Illinois River, Illinois: Continuing improvement and for maintenance, fifty thousand dollars, of which amount such portion as may be necessary may be expended for snagging and maintenance: *Provided*, That the annual appropriation for operating snag boats on the upper Mississippi River, made by section seven of the Act of August eleventh, eighteen hundred and eighty-eight, entitled "An Act making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes," is hereby made available for similar purposes on the Illinois River, from its mouth to Copperas Creek.

Proviso. Snag boats. Vol. 25, pp. 420, 424.

Copperas Creek to La Salle.

Improving Illinois River, Illinois, from Copperas Creek to La Salle, by dredging and other improvement, fifty thousand dollars.

Fox River, Ill. Dam authorized across, in McHenry County.

FOX RIVER, ILLINOIS: Permission is hereby given to the Fox River Navigable Water-Way Association to construct a dam across said river at or about fourteen thousand six hundred feet below the highway bridge at McHenry, in McHenry County, Illinois: *Providing, however*, That the right is hereby reserved to alter, change, amend, or repeal this provision at the pleasure of Congress: *And providing further*, That nothing contained in this paragraph shall be construed as relieving the Fox River Navigable Water-Way Association from liability for any damage inflicted upon private property by reason of the construction of the dam as aforesaid.

Provisos. Amendment. Damages.

Former permission for dam revoked. Vol. 32, p. 364.

The permission granted to the Fox River Navigable Water-Way Association under river and harbor Act approved June thirteenth, nineteen hundred and two, to construct a dam across said river in the northwest quarter of section thirty-six, in township forty-five, in range eight, east of the third principal meridian, same being about three thousand feet below the highway bridge at McHenry, in McHenry County, Illinois, is hereby repealed.

Rock River, Ill. Dam authorized across, at Sterling.

The Secretary of War is authorized to permit the Sterling Hydraulic Company, of Sterling, Illinois, to erect, own, and operate a power station in connection with the dam built or to be built by the United States in Rock River at or near Sterling, Illinois, in connection with the construction of the Illinois and Mississippi Canal: *Provided*, That the location and plans of said power station shall be subject to the approval of the Secretary of War: *Provided further*, That the navigation of Rock River and of the Illinois and Mississippi Canal and the operation and maintenance of said dam shall be in no way obstructed

Provisos. Approval of location, etc. Navigation not to be obstructed.

thereby: *And provided further*, That prior to the issue of said permit the Sterling Hydraulic Company shall waive any and all claims that it may have against the United States by reason of the construction, operation, and maintenance of the Illinois and Mississippi Canal, except such claims as it may have for the abstraction from Rock River of more than three hundred cubic feet of water per second when the flow of Rock River immediately above is less than one thousand cubic feet of water per second.

Condition.

Improving Mississippi River, from Head of the Passes to the mouth of the Ohio River, including salaries, clerical, official, traveling, and miscellaneous expenses of the Mississippi River Commission: Continuing improvement, three million dollars, which shall be expended under the direction of the Secretary of War in accordance with the plans, specifications and recommendations of the Mississippi River Commission as approved by the Chief of Engineers for the general improvement of the river, for the building of levees between the Head of the Passes and Cape Girardeau, Missouri, and for surveys, including the survey from the Head of the Passes to the headwaters of the river, in such manner as in their opinion shall best improve navigation and promote the interests of commerce at all stages of the river: *Provided*, That on and after the passage of this Act the Secretary of War may enter into additional contracts for such materials and work as may be necessary to carry on continuously the plans of the Mississippi River Commission as aforesaid, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate six million dollars, exclusive of the amounts herein and heretofore appropriated: *Provided further*, That the authorized sum last named shall be used in prosecuting the improvement for not less than three years, beginning July first, nineteen hundred and eight, the work thus done each year to cost approximately two million dollars: *And provided further*, That the money hereby appropriated and authorized to be expended, in pursuance of contracts or otherwise, or so much thereof as may be necessary, shall be expended in the construction of suitable and necessary dredge boats and other devices and appliances and in the maintenance and operation of the same, with the view of ultimately obtaining and maintaining a navigable channel from Cairo down not less than two hundred and fifty feet in width and nine feet in depth at all periods of the year, except when navigation is closed by ice: *And provided further*, That the water courses connected with said river, and the harbors upon it, now under the control of the Mississippi River Commission and under improvement, may, in the discretion of said Commission, upon approval by the Chief of Engineers, receive allotments for improvements now under way or hereafter to be

Mississippi River Commission.

Head of Passes to mouth of Ohio.

Expenses, etc.

Provisos.

Additional contracts.

Annual allotment.

Dredge boats, etc.

Channel below Cairo.

Allotments for improvements.

undertaken, to be paid for from the amounts herein appropriated or authorized.

Mississippi River. Mouth of Ohio to the Missouri. *Provisos.* Contracts.

Improving the Mississippi River from the mouth of the Ohio River to and including the mouth of the Missouri River: Continuing improvement, two hundred and fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate seven hundred and fifty thousand dollars, exclusive of the amounts herein and heretofore appropriated: *Provided further*, That the authorized sum last named shall be used in prosecuting the improvement for not less than three years, beginning July first, nineteen hundred and eight, the work thus done each year to cost approximately two hundred and fifty thousand dollars: *And provided further*, That the sums herein appropriated and authorized shall be expended in the operation and maintenance of the dredging plant already constructed and authorized for the improvement, and in temporary expedients of channel regulation connected with such operation, and in the maintenance and repair of the permanent works already constructed, except that such portion of the authorized annual expenditure as shall not be necessary for the accomplishment of the above-named purposes may be expended in the construction of permanent works of channel regulation.

Annual allotment.

Dredging plant, etc.

Board to examine and report on 14-foot channel, St. Louis to mouth of river.

The Secretary of War may appoint a board of five members, to be composed of three members of the Mississippi River Commission, one of whom shall be the president of such commission, and two engineer officers of the United States Army, to examine the Mississippi River below Saint Louis and report to Congress, at the earliest date by which a thorough examination can be made, upon the practicability and desirability of constructing and maintaining a navigable channel fourteen feet deep and of suitable width from Saint Louis to the mouth of the river, either by the improvement of said river or by a canal or canals for part of said route. In its report the board shall cover the probable cost of such improvement, the probable cost of maintenance, and the present and prospective commerce of said waterway, both local and general, upstream as well as downstream, and the said board may consider in connection with the examination herein provided for, the survey of a proposed waterway from Chicago to Saint Louis, heretofore reported; it shall also report whether other plans of improvement can be devised by which the probable demands of traffic, present and prospective, can be adequately met, and the sum of one hundred and ninety thousand dollars, or so much thereof as may be necessary, is hereby appropriated for the making of such survey, of which amount only one hundred thousand dollars shall be available, unless in

Scope.

presenting a plan for such waterway it shall be necessary, in the judgment of said board, to make a survey for a lateral canal or canals; and the force, plant, and records of the Mississippi River Commission shall be available for the use of said board in making said examination; and said board shall also at the earliest date practicable report upon the following:

Subjects of report.

First. What depth of channel is it practicable to produce between Saint Louis and Cairo at low water by means of regulation works.

Second. What depth will obtain in such regulated channel at the average stage of water for the year.

Third. For what average number of days annually will fourteen feet of water obtain in such regulated channel.

Fourth. What increase of depth will be obtained over the natural flow of water in such regulated channel by an added volume of ten thousand cubic feet per second; also fourteen thousand cubic feet per second.

Fifth. And the board shall consider further the practicability of producing at all seasons of the year a depth of fourteen feet in such regulated channel by the aid of locks and dams similar to those projected and in use on the Ohio River improvement.

Sixth. And the said Board shall also report upon any water power which may be created in the portion herein directed to be surveyed, as well as in the proposed waterway from Saint Louis to Chicago heretofore surveyed, and the value thereof, and what means should be taken in order that the Government of the United States may conserve the same or receive adequate compensation therefor, and upon any lands which may be drained by the construction of either of said proposed waterways, and shall also report what steps, if any, shall be taken to cause the cost of the improvement to be defrayed, in whole or part, by means of such water power or lands.

Mouth of Missouri to Minneapolis, Minn.

Provisos.

Contracts.

Improving the Mississippi River from the mouth of the Missouri River to Minneapolis, Minnesota: Continuing improvement, five hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one million five hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated: *Provided further*, That the authorized sum last named shall be used in prosecuting the improvement for not less than three years beginning July first, nineteen hundred and eight, the work thus done each year to cost approximately five hundred thousand dollars; and the Secretary of War may prosecute this work in accordance with the report submitted in House Document Numbered Three hundred and forty-one, Fifty-ninth Congress, second session, for the purpose of ultimately securing and maintaining a depth of chan-

Annual allotments.

Dredging.

nel of six feet: *And provided further*, That of the sums herein appropriated and authorized for this improvement a portion not to exceed fifty thousand dollars may, in the discretion of the Secretary of War, be expended annually for the first two years for dredging for the benefit of through navigation in harbors and at landing places, giving preference to localities in which the communities interested shall thereafter maintain such dredging without cost to the United States.

Sandy Lake reservoir dam, Minn.

For reconstruction of Sandy Lake reservoir dam, Minnesota, without a lock for steamboats, seventy-five thousand dollars.

Reservoirs.

For the construction of low reservoir dam at Gull Lake, Minnesota (project numbered one), and ditches between Gull Lake and Round Lake, and between Round Lake and Long Lake, Minnesota, seventy thousand dollars: *Provided*, That the land required for the construction of said Gull Lake dam and reservoir, together with any flowage rights which may be necessary, shall be ceded to the United States without charge.

Proviso. Condition.

Osage River, Mo.

Improving Osage River, Missouri: Continuing improvement and for maintenance, seventy-eight thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work, as are necessary for the completion of said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and sixty thousand dollars, in addition to the amounts herein and heretofore appropriated.

Proviso. Contracts.

Gasconade River, Mo.

Improving Gasconade River, Missouri: Continuing improvement and for maintenance, ten thousand dollars.

Missouri River. Mouth to Fort Benton. Allotment.

Improving Missouri River from the mouth to Fort Benton: For maintenance, four hundred thousand dollars, of which amount one hundred and fifty thousand dollars may be expended between the mouth and Kansas City, one hundred and fifty thousand dollars between Kansas City and Sioux City, and one hundred thousand dollars between Sioux City and Fort Benton, one-half of which last amount shall be expended north of the forty-sixth parallel: *Provided*, That these amounts shall be applied in the first instance for the purpose of clearing the river of snags with a view to navigation, and no part of such amount shall be applied for revetment or the protection of banks of the stream unless such revetment or protection is directly and necessarily required for purposes of navigation: *Provided further*, That so much of the amount as is to be expended north of the forty-sixth parallel may be applied for improving the harbor at Bismarck, North Dakota, on the east side of the river below the Northern Pacific Railroad bridge: *Provided, further, also*, That the Secretary of War shall, as soon as practicable, cause a survey to be made to determine the necessity of continuing the improvement of the Missouri River at Saint Joseph, Missouri, to prevent a diversion of the

Provisos. Snagging, etc.

Bismarck, N. Dak.

Survey at St. Joseph, Mo.

waters of said river through Lake Contrary and other contiguous lakes, and to determine the effect of such diversion, with an estimate of the cost of the improvement, and shall also report whether the same is directly and necessarily required in the interest of navigation.

San Diego, Cal.

Improving San Diego Harbor, California: For maintenance, twenty thousand dollars.

Wilmington, Cal.

Improving Wilmington Harbor, California: Completing improvement, one hundred and thirteen thousand dollars.

San Luis Obispo, Cal.

Improving San Luis Obispo Harbor, California: Continuing improvement, sixty-three thousand six hundred and sixty dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and labor as are necessary to complete the said projects, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

Oakland, Cal.

Improving harbor at Oakland, California: Continuing improvement, sixty-eight thousand two hundred and three dollars: *Provided*, That the adopted project may be extended as recommended by the Board of Review on Rivers and Harbors in a report dated January eleventh, nineteen hundred and seven, so as to include the following work: Extension of South Jetty, five hundred feet; widening to five hundred feet the channel twenty-five feet deep from San Francisco Bay to Fallon street; deepening to twenty-five feet the channel three hundred feet wide from Fallon street to the tidal basin; deepening to seventeen feet the channel three hundred feet wide around the north side of the tidal basin to the tidal canal, and from the tidal canal along the Alameda shore to Tenth avenue, and any balance remaining of appropriations or authorizations heretofore made for the improvement of the harbor of Oakland, may be applied to the project as so extended: *Provided further*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said improvement as herein adopted, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred thousand dollars, in addition to the amounts herein and heretofore appropriated or authorized for said harbor.

Provisos. Extension of adopted project.

Contracts, etc.

Humboldt, Cal.

Improving Humboldt Harbor and Bay, California, in accordance with the report submitted in House Document Numbered Two hundred and twenty-eight, Fifty-ninth Congress, first session: Completing improvement, eighty-three thousand dollars.

San Joaquin River, Cal.

Improving San Joaquin River, California: For maintenance, thirty thousand dollars.

Stockton and Mormon channels, Cal.

The Secretary of War is authorized to enter into a contract or contracts for such materials and work as may be required for the completion of the Stockton and Mormon

Contracts authorized.

channels, California, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding fifty-six thousand and seventy-nine dollars, exclusive of the amounts heretofore appropriated or authorized.

Mokelumne River, Cal.

Improving Mokelumne River, California: For maintenance, two thousand five hundred dollars.

Sacramento and Feather rivers, Cal.

Improving Sacramento and Feather rivers, California: Continuing improvement and for maintenance, fifty thousand dollars.

Petaluma Creek and Napa River, Cal.

Improving Petaluma Creek and Napa River, California, twenty-three thousand two hundred and thirty-nine dollars, of which amount fifteen thousand two hundred and thirty-nine dollars may be expended in completing the improvement of Petaluma Creek in accordance with the report submitted in House Document Numbered Three hundred and eighty-seven, Fifty-ninth Congress, first session.

Tillamook Bay and Bar, Oreg.

Improving Tillamook Bay and Bar, Oregon: For maintenance, ten thousand dollars.

Coquille River, Oreg.

Improving Coquille River, Oregon: Continuing improvement and for maintenance, sixty thousand dollars.

Coos River, Oreg.

Improving Coos River, Oregon: For maintenance, three thousand dollars.

Willamette and Yamhill rivers, Oreg.

Improving Willamette River above Portland and Yamhill River, Oregon: Continuing improvement and for maintenance, sixty thousand dollars.

Willamette and Columbia rivers.

Improving the lower Willamette and Columbia rivers below Portland, Oregon: Continuing improvement, to be expended in the construction and operation of a dredge, three hundred thousand dollars.

Columbia River. Improving mouth.

Improving the mouth of Columbia River, Oregon and Washington: Continuing improvement, seven hundred and fifty thousand two hundred and forty-four dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one million seven hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

The Dalles to Celilo Falls.

Improving the Columbia River between the foot of The Dalles Rapids and the head of Celilo Falls, Oregon and Washington: Continuing improvement, one hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate five hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

And tributaries above *Celilo Falls.*

Improving the Columbia River and tributaries above Celilo Falls to the mouth of Snake River, Oregon and Washington: Continuing improvement, in accordance

with the report submitted in House Document Numbered Four hundred and forty, Fifty-ninth Congress, second session, one hundred and twenty thousand dollars; and the Secretary of War is authorized and directed to use any additional moneys that may be placed at his disposal by the States of Oregon or Washington for the improvement of the Columbia River above Celilo Falls and the Snake River in accordance with the said report, and said Secretary is also authorized to use any Government plant available in connection therewith.

Use of money from States.

Construction of dredge for Oregon and Washington: For the construction of a dredge, to be used in the harbors and coast waters of Oregon and Washington and to be operated and maintained out of funds available for such harbors and coast waters, one hundred thousand dollars.

Dredge for Oregon and Washington.

Improving Upper Columbia and Snake rivers, Oregon, Washington, and Idaho: Continuing improvement and for maintenance, ten thousand dollars, which may be expended in completing the improvement and for maintenance of the Snake River between Riparia and Lewiston, and between Lewiston and Pittsburg Landing.

Upper Columbia and Snake rivers.

Improving Grays Harbor and bar entrance, Washington: Continuing improvement by means of north jetty, in accordance with the report of the Board of Engineers transmitted to the Committee on Rivers and Harbors, under date of December twenty-eighth, nineteen hundred and six, two hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate four hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Grays Harbor, Wash. North jetty.

Proviso. Contracts.

Improving Grays Harbor, inner portion, between Aberdeen and the entrance to said harbor, and Chehalis River, Washington: Continuing improvement in accordance with the project submitted in House Document Numbered Five hundred and seven, Fifty-ninth Congress, first session, with a view to securing a channel two hundred feet wide and eighteen feet deep at mean lower low water, and removing snags from the Chehalis River, one hundred and seventy-seven thousand dollars; and the amount of prior appropriations made for the improvement of the inner portion of Grays Harbor, and now on hand, is hereby made available for this project in addition to said sum, and the Secretary of War is directed to cause a survey and estimate to be made with a view to the improvement of the Chehalis River up to Montesano by the removal of bars.

Inner harbor and Chehalis River, Wash.

Balances available.

Improving Grays River, Washington: Continuing improvement in accordance with the project submitted in the report of the Board of Engineers to the Committee on Rivers and Harbors, dated October fifteenth, nineteen hundred and six, two thousand five hundred dollars.

Grays River, Wash.

Puget Sound, Wash.
Waterway to Lakes Union and Washington.
Survey for canal.

Improving the waterway connecting Puget Sound with Lakes Union and Washington, Washington: For maintenance of improvement, ten thousand dollars; and the Secretary of War may make a survey and estimate of cost of said waterway or canal with one lock, with a view to the construction of the same, in conjunction with the county authorities of King County or other agency, of sufficient size to accommodate the largest commercial or naval vessels afloat; or, if deemed more advisable, with a view to the construction of a canal of less dimensions, and to submit dimensions and estimate of cost of same, together with a report upon what portion of said work will be done or contribution to be made by said county or other agency. And the provisions of the Act approved June eleventh, nineteen hundred and six, authorizing James A. Moore, or his assigns, to construct a canal, with suitable timber lock, are hereby so modified as to permit the said James A. Moore, or his assigns, subject to the conditions and stipulations of the Act, to excavate a channel seventy-five feet wide at the bottom and twenty-five feet deep at mean low water from deep water in Puget Sound at the mouth of Salmon Bay to deep water in Lake Washington, in lieu of constructing the canal and timber lock specified in the said Act, the location of the said channel and work of excavation to be subject to the direction of the Secretary of War, and the plans and order of work to be subject to his approval before beginning and when completed and accepted by the Secretary of War, the channel to be and remain a free public waterway of the United States.

Canal by James A. Moore, modified.
Vol. 34, p. 231.

Willapa River and Harbor, Wash.

Improving Willapa River and Harbor, Washington: Continuing improvement in accordance with the project submitted in House Document Numbered Four hundred and seventy-seven, Fifty-ninth Congress, first session, twenty-five thousand dollars.

Cowlitz and Lewis rivers, Wash.

Improving the Cowlitz and Lewis rivers, including the North Fork of the Lewis River, Washington: Continuing improvement and for maintenance, fifteen thousand dollars.

Puget Sound, etc., Wash.

Improving Puget Sound and its tributary waters, Washington: Continuing improvement and for maintenance, seventy-five thousand dollars, of which amount thirty thousand dollars, or so much thereof as may be necessary, may be expended in the removal of rock obstructions at the mouth of Roche Harbor.

Swinomish Slough, Wash.

Improving Swinomish Slough, Washington: Continuing improvement, seventy-five thousand dollars.

Columbia River, Wash.
Wenatchee to Bridgeport.

Improving Columbia River, between Wenatchee and Bridgeport, Washington: Continuing improvement in accordance with the report submitted in House Document Numbered Four hundred and forty, Fifty-ninth Congress, second session, forty-two thousand dollars.

Okanogan and Pend Oreille rivers, Wash.

Improving the Okanogan and Pend Oreille rivers, Washington: For maintenance of the Okanogan and Pend

Oreille rivers and for continuing the improvement [*sic*] the Pend Oreille River by removing bars, twenty thousand dollars.

Improving Saint Michael Canal, Alaska, in accordance with the project submitted in House Document Numbered Three hundred and eighty-nine, Fifty-ninth Congress, second session, ninety-eight thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete said project, to be appropriated from time to time as provided by law, not to exceed in the aggregate one hundred and fifty thousand dollars, exclusive of the amount herein appropriated.

St. Michael Canal.

Proviso.

Contracts.

That the proviso in the river and harbor Act of March third, nineteen hundred and five, providing for the forfeiture of the rights granted to the Nome Improvement Company to dredge the Snake River and to extend the channel thereof seaward, be, and the same is hereby, amended to read as follows:

Snake River, Alaska.

Time extended for canal by Nome Improvement Company.

"*Provided further*, That if, after January first, nineteen hundred and nine, the said improvement company shall, at any time during the season of navigation, permit any portion of said channel between the jetties, including that portion of the river improved by it, for three consecutive months, to be of less depth than six feet at mean low tide for a full width of fifty feet, then all rights of said company as herein determined shall cease, and the harbor improvements constructed, including bulkheads, jetties, and rights in reclaimed lands, shall become the property of the United States without recompense to the company."

Forfeiture extended to 1909.

Vol. 33, p. 1146, amended.

Improving Honolulu Harbor, Hawaii: Continuing improvement and for maintenance, according to the report submitted in House Document Numbered Three hundred and thirty-two, Fifty-ninth Congress, second session, two hundred thousand dollars: *Provided*, That a contract or contracts may be entered into by the Secretary of War for such materials and work as may be necessary to prosecute said project, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding in the aggregate two hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Honolulu, Hawaii.

Proviso.

Contracts.

Improving Hilo Harbor, Hawaii, in accordance with the project submitted in House Document Numbered Four hundred and seven, Fifty-ninth Congress, second session, two hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute said project to an amount not exceeding in the aggregate two hundred thousand dollars, to be paid for as appropriations may from time to time be made by law, in addition to the amounts herein appropriated: *Provided further*, That modifications in said plan may be made in the *discretion of* the Secretary of War, and

Hilo, Hawaii.

Provisos.

Contracts.

Modifications allowed.

that no part of said appropriation or authorization shall be expended unless the Chief of Engineers, upon further investigation, shall determine that commercial benefits accruing from such expenditure will warrant the same.

San Juan, P. R.

Improving the harbor of San Juan, Porto Rico, in accordance with the report submitted in House Document Numbered Nine hundred and fourteen, Fifty-ninth Congress, first session, one hundred and fifty-seven thousand five hundred dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as are necessary for the prosecution of said project, to be paid for as appropriations may from time to time be made by law, to an amount not exceeding in the aggregate six hundred thousand dollars, in addition to the amount herein appropriated, and in the prosecution of the same may be included the dredging of the entrance channel and areas to the east of the Puntilla de la Marina for passage and anchorage, of three hundred and ninety-eight thousand six hundred square yards to be dredged to a depth of thirty feet, and seventy thousand two hundred square yards to a depth of twenty-four feet.

Proviso. Contracts.

Dredging.

Emergency appropriation.

For emergencies: To provide for the restoration of channels, or river and harbor improvements heretofore established or made by the Government, or herein provided for, where by reason of emergency occurring after the passage of this Act the usual depth of such channels or customary use of such improvement can not be maintained, and there is no sufficient fund available for such restoration, three hundred thousand dollars. The amount herein provided shall be allotted by the Secretary of War: *Provided*, That in no case shall such allotment be made unless recommended by the local engineer having such channel or improvement in charge, and by the Chief of Engineers, respectively: *Provided further*, That for no single channel or improvement shall a sum greater than ten thousand dollars be allotted.

Provisos. Allotments.

Maximum allotments.

Tidal water depths.

The depth of water in tidal waters, as well as in rivers and nontidal channels, whenever referred to in this Act shall be understood to mean the depth at mean low water unless otherwise expressed.

Use of appropriations.

Appropriations made for the respective works herein named, or so much thereof as may be necessary, may, in the discretion of the Secretary of War, be used for maintenance and for the repair and restoration of said works whenever from any cause they have become seriously impaired, as well as for the further improvement of said works.

Surveys and examinations.

Surveys and examinations provided for in this section shall, unless otherwise expressed, be paid for from the appropriations made for the respective improvements or projects to which they pertain or in connection with which they are mentioned.

All works of improvement heretofore or herein authorized to be prosecuted or completed under contracts may, in the discretion of the Secretary of War, be carried on by contract or otherwise, as may be most economical or advantageous to the United States. Contracts, etc.

Where separate works or items are consolidated in this Act and an aggregate amount is appropriated therefor, the amounts herein appropriated shall, unless otherwise expressed, be expended in securing maintenance and improvement according to the respective projects herein or heretofore adopted by Congress, after giving due regard to the respective needs of traffic. The allotments to the respective works herein consolidated shall be made by the Secretary of War upon recommendations by the Chief of Engineers. In case such works or items are consolidated and separate amounts are given with each project, the amounts so named shall be expended upon such separate projects unless in the discretion of the Secretary of War another allotment or division should be made of the same. Any balances now remaining to the credit of the consolidated items in this Act shall be carried to the credit of the respective aggregate amounts appropriated for the consolidated items herein contained. Allotment to consolidated works. Use of balances.

In all cases where appropriations are made for works in this Act, if money can be more advantageously expended by combining under one contract two or more such works, such combinations are authorized and shall be made. Combining contracts.

In all cases in which appropriations or authorizations have heretofore been made, or are herein made, for the completion of river and harbor works, and the amounts appropriated or authorized shall prove insufficient for completion, the Secretary of War may, in his discretion, on the recommendation of the Chief of Engineers, apply such amounts appropriated or authorized for the prosecution of such work. Insufficient appropriations.

SEC. 2. For preliminary examinations and surveys (other than those mentioned in section one), contingencies, and for incidental repairs for which there is no special appropriation for rivers and harbors, three hundred and fifty thousand dollars: *Provided*, That no preliminary examination, survey, project, or estimate for new works other than those designated in this or some prior Act or joint resolution shall be made: *Provided further*, That after the regular or formal reports made as required by law on any examination, survey, project, or work under way or proposed are submitted no supplemental or additional report or estimate shall be made unless ordered by a concurrent resolution of Congress. The Government shall not be deemed to have entered upon any project for the improvement of any waterway or harbor mentioned in this Act until funds for the commencement of the proposed work shall have been actually appropri- Preliminary examinations. Appropriation. *Provisos.* New works. Supplemental reports.

Payment for examinations, etc., Porto Rico, piers, etc.

ated by law: *Provided further*, That all expenses heretofore and hereafter incurred by the War Department for examinations, reports, inspections, superintendence, or any other action necessary in executing the provisions of the Act of Congress approved June eleventh, nineteen hundred and six, entitled "An Act to empower the Secretary of War, under certain restrictions, to authorize the construction, extension, and maintenance of wharves, piers, and other structures on lands underlying harbor areas and navigable streams and bodies of water in or surrounding Porto Rico and the islands adjacent thereto," shall be payable from funds herein and hereafter appropriated for examinations, surveys, and contingencies of rivers and harbors, the allotments for such expenses to be made by the Chief of Engineers.

Vol. 34, p. 234.

Preliminary examinations authorized.

SEC. 3. That the Secretary of War is hereby directed to cause preliminary examinations or surveys to be made at the following localities:

Alabama.

ALABAMA.

Choctawhatchee River, to provide depth of three feet up to Newton.

The channels connecting Mobile Bay and Mississippi Sound, with a view to obtaining a channel of a depth of ten feet.

Alabama and Coosa rivers, between Montgomery and Wetumpka.

Coosa River, with a view to locating and constructing Dam Numbered Five.

Sipsey River, from its mouth to Fayette.

Alaska.

ALASKA.

Dry Straits, with a view to securing an alternative channel to Wrangell Narrows.

Katalla Bay and adjacent bays, with a view to the establishment of a harbor.

Arkansas.

ARKANSAS.

Saline River, from the mouth of same north to Turtle Bar, on said river, with a view of dredging and other work.

California.

CALIFORNIA.

Islais River, with a view of obtaining a depth of twenty-six feet from its mouth in San Francisco Bay for a distance of one mile.

San Francisco Harbor, with a view to the removal of Mission Bay rocks, Packard rock, Whiting rock, Fifteen foot rock, Invincible rocks, Noonday rocks, and Anita rock. Also Centissima and Sears rock and two other rocks near Mail Dock in Bonita Channel.

San Joaquin River and its tributary, Stockton Channel, from San Francisco Bay to Stockton.
Sacramento River, from its mouth to Feather River.
Suisun Channel.
Newport Harbor.
Humboldt Harbor, with a view to improving the entrance thereto.
San Diego Harbor, and the entrance thereto.
Wilmington Harbor, with a view to obtaining an increased depth.
San Pedro Breakwaters, with a view to determining whether the same should be extended to the shore.

CONNECTICUT. Connecticut.

Branford Harbor.
New Haven Harbor, with a view to determining whether a greater depth is needed, also the rocks in Morris Cove.
New London Harbor, with a view to securing a depth of fifteen feet in Shaws Cove.
A further examination and survey for a harbor of refuge at Duck Island, and in connection therewith for a breakwater at Kelseys Point, Connecticut.
Connecticut River, with a view to removing obstructions in Eight Mile River and East Branch.
Coscob Harbor, with a view to obtaining a sufficient depth to drawbridge.

DELAWARE. Delaware.

Smyrna River.
Little River, from the mouth of the same to the town of Little Creek.
To connect by canal, Rehoboth Bay with Delaware Bay at or near Lewes, through Lewes Creek and Gordon Lake.
Saint Jones River, from its mouth to Dover.

FLORIDA. Florida.

Saint Lucia Inlet.
Saint Josephs Bay.
Wekiwa River.
Wakulla River from the town of Saint Marks to the Gulf, and Saint Marks River.
Estero Bay.
Hillsboro Bay, from turning basin to head of the Estuary in the direction of Ybor.
Crystal River.
Clearwater Harbor and Boca Ceiga Bay to Tampa Bay.
Saint Andrews Bay.
Saint Marks River, at the mouth.
Pensacola Bay to quarantine station, with a view to getting twenty-four feet of water.
Saint Johns River from Sanford to Lake Harney.

Caloosahatchee River, from Lake Okechobee to the Gulf, including Orange River.

Saint Johns River, from Jacksonville to Sanford.

Key West Harbor.

Georgia.

GEORGIA.

Coosa River at Horseleg shoals, with a view to the construction of a lock and dam.

Savannah River, for thirty miles below Augusta.

Illinois.

ILLINOIS.

Calumet River, with a view to obtaining a depth of twenty feet from One hundred and twenty-second street to its forks.

Indiana.

INDIANA.

Harbor at Gary, with a view to determining whether a breakwater is necessary.

Indiana Harbor, with a view to determining whether improvement of the harbor is advisable.

Louisiana.

LOUISIANA.

Lake Ponchartrain, from West End Spanish Fort and Milneburg to the north and south draws of the New Orleans and Northeastern Railroad, also to Mandeville, the Tangipahoa River, and Pass Manchac, with a view to the removal of obstructions to navigation.

Pass Manchac, between Lake Maurepas and Lake Ponchartrain.

Lake Ponchartrain, west end to mouth of Bayou Saint John and thence to Milneburg.

Sabine River, from its mouth to Belzora and Logansport.

Bayou Plaquemine Brule.

Bayou Terrebonne, with a view to obtaining six feet of water.

Bayou Vermilion to Lafayette, with a view to obtaining six feet of water.

Bayou Courtableau, with a view to obtaining twelve feet of water.

Boyce Landing, on the Red River, with a view to ascertaining whether any improvements are required in the interest of navigation.

Maine.

MAINE.

East Boothbay, with a view to obtaining eight feet of water.

Rockport Harbor, with a view to removing the beacon and ledge.

Camden Harbor.

Matinicus, with a view to a harbor of refuge.

Tenants Harbor, with a view to obtaining eight feet of water.

South Harpswell, with a view to removing ledge off Potts Point.

Pepperells Cove, with a view to its deepening and the removal of a ledge.

Passage between Peaks Island and Great Diamond Island, between the main channel and Husseys Sound, with a view to obtaining greater depth.

Penobscot Bay, from the southern extremity of Macks Point to the eastern extremity of Cape Jellison, with a view to the establishment of a harbor having a depth of twenty-five feet, or sufficient to meet the demands of commerce.

MARYLAND. Maryland.

Patuxent River.

Northwest Fork, Nanticoke River, from its mouth to Federalsburg, with a view to removing shoals and obtaining a depth of six feet.

Tuckahoe River, with a view to obtaining an increased depth from Waymans Wharf to the town of Hillsboro.

Lower Thoroughfare, at or near Wenona, Deals Island, with a view to deepening the channel and constructing a basin.

Potomac River, with a view to obtaining greater depth to Lower Cedar Point.

MASSACHUSETTS. Massachusetts.

Lynn Harbor, with a view to obtaining a turning basin five hundred feet square and fifteen feet deep, straightening the present channel, and making a channel three hundred feet wide and fifteen feet deep from deep water to wharves at head of harbor.

Gloucester Harbor, with a view to removing ledges.

Plymouth Harbor, with a view to the construction of a rubblestone breakwater, extending from Long Beach easterly along the crest of Browns Island.

Merrimac River, with a view to providing by locks and dams a channel fourteen feet deep from the mouth of the river to the railroad bridge at Haverhill.

Mystic River, with a view to the construction of a channel thirty feet deep from the mouth of Island End River to Chelsea Bridge.

MICHIGAN. Michigan.

Channel between Russell Island and Grand Point in the Saint Clair River.

Ontonagon Harbor, with a view to determining whether a change in the course of the Ontonagon River may not aid in maintaining the harbor.

Menominee Harbor, with a view to determining whether a breakwater is necessary.

Keweenaw Canal, with a view to the construction of a harbor of refuge at its eastern entrance.

Munising Harbor.

Au Sable River, with a view to obtaining a depth of ten feet.

Minnesota.

MINNESOTA.

Grand Marais Harbor, with a view to rebuilding the piers at the entrance and enlarging basin.

Boise de Sioux River, Lake Traverse, and Big Stone Lake, and the portages between the said lakes and said river, with a view to diverting the flood waters of the Red River of the North into the Minnesota River.

Lake Superior, with a view to locating a harbor or harbors of refuge on the north shore.

Mississippi.

MISSISSIPPI.

Biloxi Harbor, with a view to extending and deepening the channel into the harbor and around the eastern end of the peninsula into the sheltered waters of Back Bay.

East Pearl River, with a view to removing bar and restoring channel at its mouth.

Steeles and Washingtons bayous, and Lake Washington from mouth of Steeles Bayou to Glen Allen.

Roebuck Lake, from its mouth to railroad bridge at Itta Bena.

Bear Creek.

Homochitto River, from its mouth to the Yazoo and Mississippi Valley Railroad.

Big Sunflower River from near Baird to the mouth of the Hushpucena River, with a view to obtaining continuous navigation by locks and dams in the upper section, as designated in the report submitted in House Document Numbered Six hundred and sixty-seven, Fifty-ninth Congress, first session.

Missouri.

MISSOURI.

Osage River, with a view to obtaining three feet depth from its mouth to mouth of Niangua River.

Gasconade River, with a view to obtaining three feet depth from its mouth to Gascondy.

Missouri River from its mouth to Kansas City, and from Kansas City to Sioux City: *Provided*, That the Secretary of War may, in his discretion, cause to be made only such further general instrumental survey as may be deemed necessary.

New Hampshire.

NEW HAMPSHIRE.

Isles of Shoals, with a view to the construction of a breakwater.

NEW JERSEY.

New Jersey.

Toms River, with a view to obtaining five feet of water on shoals near village of Toms River.

Forked River, from its mouth to the town of Forked River, with a view to obtaining a depth of five feet.

Rahway River.

Old Mans Creek.

Arthur Kill, westerly side of Buckwheat Island, with a view to deepening the channel.

NEW YORK.

New York.

Jamaica Bay.

The waters of Jamaica Bay, including entrance to said bay at Rockaway Inlet and those waters having their outlet in Dead Horse Inlet, with a view to framing a plan for their improvement and recommending the order of such improvement with the cost thereof, and to recommend the proportion of such cost to be borne by the city of New York; and the Secretary of War is hereby requested to confer and cooperate with the commissioner of docks and ferries of the city of New York, or with any other duly authorized agents, officers, or representatives of the city of New York, and with any commission of engineers appointed, or who shall hereafter be appointed, to survey or examine said bay and to recommend to the city of New York, plans for the improvement of said Jamaica Bay or the lands in and about said bay.

Conference with New York City authorities.

Port Chester Harbor, with a view to obtaining a depth of fifteen feet with corresponding width.

Echo Bay, with a view to obtaining a depth of twelve feet.

Dunkirk Harbor.

East Chester Creek, with a view to obtaining a depth of twelve feet.

Jamaica Bay, with a view to obtaining a channel one hundred feet wide and six feet deep to and through Great South Bay to Peconic Bay, including channels to Parsonage and Sumpawams rivers and Freeport and Massapequa creeks.

Channel between Three Mile Harbor and Gardiners Bay.

Channel from Peters Neck Point through Long Beach Bay to Horn River.

Hempstead Harbor, with a view to obtaining a depth of six feet.

East River, between North Brother and South Brother Islands, with a view to obtaining depths of twenty, twenty-two, and twenty-four feet.

Hudson River: Shoal off Stuyvesant Harbor.

Ogdensburg Harbor, with a view to obtaining depth of nineteen feet in the four existing channels and the excavation of the bar between the two entrance channels in the lower harbor.

Niagara River from Tonawanda to Gill Creek.

Hudson River, with a view to obtaining a depth of twelve feet from the channel to Upper Nyack and the contiguous towns of Nyack, South Nyack, Grand View, and Piermont, through the pier to the mouth of Sparkill River, and east to the main channel.

Neversink River, with a view to the removal of bars and other obstructions at and near its mouth.

Minisceongo River, with a view to obtaining a depth of seven feet.

North Carolina.

NORTH CAROLINA.

Trent River, with a view to obtaining eight feet of water from Newbern to Trenton.

New River, with a view to obtaining a depth of five feet from its mouth to Jacksonville.

White Oak River, with a view to obtaining five feet from its mouth to Maysville.

Little River, with a view to removing bar at its mouth.

Shallow Bag Bay, with a view to obtaining a depth of eight feet at its mouth.

South River, with a view to obtaining six, seven, and eight feet, respectively, from its mouth to Aurora.

Beaufort Harbor, with a view to a channel depth of twenty-five feet across the bar.

Waterway connecting Swan Quarter Bay with Deep Bay, with a view to obtaining a depth of six, seven, and eight feet, respectively.

North Dakota.

NORTH DAKOTA.

Red River of the North, with a view to straightening and deepening the channel.

Ohio.

OHIO.

Harbor at Rocky River, with a view to repairing existing structures and extension of the harbor.

Lorain Harbor: That portion of Black River from the inner end of the Government piers to East Erie Avenue Bridge.

Maumee River, from deep water in Lake Erie to the Fassett Street Bridge, Toledo, with a view to obtaining greater depth and an increased width of approximately one hundred feet.

Oregon.

OREGON.

Coos Bay and bar entrance.

Coquille River, with a view to the removal of shoals and rocks at its mouth.

Tillamook Bay and bar up to Tillamook City.

PENNSYLVANIA. Pennsylvania.

Erie Harbor, with a view to obtaining a depth of twenty-two feet and protecting Presque Isle peninsula.

Youghiogheny River to Connellsville.

RHODE ISLAND. Rhode Island.

Wickford Harbor, with a view to obtaining a depth of fifteen feet and for the removal of a ledge known as General Rock.

Harbor of Refuge, Block Island, with a view to securing a greater navigable depth and a larger anchorage area.

Providence River, with a view to extending the deep water area to Kettle Point.

SOUTH CAROLINA. South Carolina.

Congaree River, from the present head of navigation to the mouth of Broad River, and Broad River from its mouth to Ninety-nine Island Shoals.

North Fork, Edisto River, from its mouth to Orangeburg, with a view to obtaining three feet of water.

Saluda River, between Columbia and Hollow Creek.

South Fork, Edisto River, from its mouth to Scotts Bridge.

Shem River.

Shipyard River.

Great Pee Dee River, from Georgetown to Pee Dee Station.

TENNESSEE. Tennessee.

Duck River, from its mouth to Centerville.

Forked Deer River, survey of its south fork.

Hatchie River, to town of Brownsville.

Elk River, from its mouth up to Fayetteville.

Beech River.

Big Sandy River.

Richland Creek.

TEXAS. Texas.

Neches River.

A channel from Palacios to Matagorda Bay.

Arroyo Colorado, with a view to obtaining a channel eight feet or less in depth from Harlingen to deep water at Point Isabel.

Caddo Lake, with a view to determining advisability of constructing a dam at the foot of said lake on the waterway connecting Jefferson, Texas, with Shreveport, Louisiana.

Pass Cavallo to Port O'Connor, with a view to establishing a harbor.

Colorado River, with a view to obtaining a navigable channel from its mouth as far up as practicable.

Texas City channel, with a view to obtaining a channel two hundred feet wide and twenty-six feet deep.

A channel from Pass Cavallo to Port Lavaca.

Vermont.

VERMONT.

Lake Champlain, to improve navigation in connection with the breakwater at Burlington, the channel known as "The Gut" between Tromps Point, South Hero Island and Bow Arrow Point, and the harbor at Saint Albans.

Virginia.

VIRGINIA.

Big Sandy River, with a view to improving its headwaters, including Pound River and Russell Fork.

Potomac River below Washington, with a view to obtaining a width of channel of four hundred feet.

Aquia Creek from Coals Landing to Wharton Landing.

Potomac River, at Alexandria, with a view to the removal of a bar recently formed.

Potomac River, with a view to obtaining a channel to wharf at Mount Vernon.

Queens Creek, with a view to obtaining a channel from its mouth to Capital Landing Bridge.

Onancock River, with a view to deepening and straightening channel for distance of five miles between Chesapeake Bay and Onancock.

Horn Harbor, with a view to removing sand bar at its mouth.

Totuskey River, with a view to removing bar about midway of its length.

Cat River, with a view to obtaining deeper channel.

Pagan River, with a view to straightening and deepening channel.

Washington.

WASHINGTON.

Cowlitz River, up to Castle Rock.

Puyallup River, with a view to straightening channel and securing suitable depth to city of Puyallup.

Skagit River, to Sedro-Woolley.

Blaine Harbor.

Bellingham Harbor.

Snohomish River, from the mouth to Lowell.

For a ship canal connecting the waters of Puget Sound with Grays Harbor.

West Virginia.

WEST VIRGINIA.

Guyandot River.

Deckers Creek, West Virginia, with a view to securing for a distance of two thousand feet up from its mouth a channel and harbor with the same depth of water as in

the Monongahela River where said Deckers Creek empties into said river.

Cheat River, for a distance of twenty-five miles up from its mouth.

WISCONSIN.

Wisconsin.

Algoma (Ahnapee), with a view to the construction of an outer harbor and obtaining a channel sixteen feet in depth. Kewaunee, with a view to obtaining depths of eighteen and twenty feet, respectively.

Extent of preliminary examinations.

In all cases, unless a survey or estimate is herein expressly directed, a preliminary examination shall first be made, which shall embrace information concerning the commercial importance, present and prospective, of the river or harbor mentioned and a report as to the advisability of its improvement. Whenever such preliminary examination has been made, in case such improvement is not deemed advisable, no surveys thereof or estimates therefor shall be made without the direction of Congress; but in case the report shall be to the effect that such river or harbor is worthy of improvement, or that a survey and estimate should be made to determine the advisability of improvement, the Secretary of War is hereby authorized, at his discretion, to cause surveys to be made and the cost of improvement of such river or harbor to be estimated and reported to Congress: *Provided*, That in all cases reports of preliminary examinations, as well as of surveys, ordered in any section of this Act, shall be examined and reviewed by the board provided for in section three of the river and harbor Act of June thirteenth, nineteen hundred and two; and the said board shall also, on request by resolution of the Committee on Commerce of the Senate or the Committee on Rivers and Harbors of the House of Representatives, examine and review the report of any examination or survey made pursuant to any Act or resolution of Congress, and report thereon through the Chief of Engineers, United States Army: *Provided further*, That in no case shall the board, in its report thus called for by committee resolution, extend the scope of the project contemplated in the original report upon which its examination and review has been requested, or in the provision of law authorizing the original examination or survey.

Surveys.

Provisos.

Review by Board of Engineers for Rivers and Harbors.

Vol. 32, p. 372.

Report.

Limit of report.

Completion of surveys, etc., ordered.

All surveys and examinations provided for by this Act, and the reports thereon, shall either be completed on or before the first Monday in November, nineteen hundred and eight, or else a preliminary report be made in which the reasons for delay shall be stated: *Provided*, That all reports of preliminary examinations and surveys which may be prepared during the recess of Congress, and be ready for printing, shall, in the discretion of the Secretary of War, be printed by the Public Printer as documents of the following session of Congress.

Proviso.

Printing.

Compilation of river and harbor laws, time extended. Vol. 32, p. 375. Vol. 33, p. 1280.

SEC. 4. That the compilation of laws of the United States relating to the improvement of rivers and harbors authorized by section thirteen of the river and harbor Act of June thirteenth, nineteen hundred and two, and joint resolution of Congress approved February first, nineteen hundred and five, shall be extended to include all such laws enacted up to the close of the second session of the Fifty-ninth Congress; and three thousand copies of this compilation shall be printed under the direction of the Secretary of War, of which six hundred copies shall be for the use of the Senate, one thousand four hundred copies for the use of the House, and one thousand copies for the use of the office of the Chief of Engineers, United States Army.

Distribution.

Dredges on Great Lakes and on Atlantic coast north of Cape Henry. Restriction repealed. Vol. 32, p. 452.

SEC. 5. That section four of the Act of Congress approved April twenty-eighth, nineteen hundred and four, entitled "An Act providing for the restoration or maintenance of channels or of river and harbor improvements, and for other purposes," be, and the same is hereby, repealed.

Dredging plants authorized.

Whenever it shall become, in the opinion of the Secretary of War, necessary or desirable to hire a dredging plant or plants for the performance of any of the public work carried on under his direction the said Secretary may, in his discretion, agree for the same, either in the manner now customary or on the basis of an equitable reimbursement for deterioration of plant when in use by the Government, and a reasonable percentage of the total cost of the work.

Hudson River, New York City. Changes of bridges authorized.

SEC. 6. That the Secretary of War may approve a change of plans or of location of any bridge over the North or Hudson River at New York City which has heretofore been approved by the Secretary of War under any Act of Congress, upon application to him by the parties authorized to erect such structure, their successors or assigns, provided that such changed location shall not be over any anchorage ground and shall be within the original authorization for such structure, and shall not be deemed by the Secretary of War to be detrimental to navigation or to the public interest after public hearings held thereon, and the structure whose changed plans or location is so approved shall be a lawful structure.

Restriction.

International Waterways Commission. Rent of offices. Vol. 32, p. 373.

SEC. 7. That those members of the International Waterways Commission created in accordance with section four of the river and harbor Act of June thirteenth, nineteen hundred and two, who represent the United States, shall have power to rent such room or rooms in Washington as may be necessary for the performance of the duties entrusted to them.

Approved, March 2, 1907.

CHAP. 2510.—An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and eight, and for other purposes.

March 2, 1907.
[H. R. 24103.]
[Public, No. 169.]
Vol. 34, pp. 1119, 1130, 1135, 1157.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the half of the following sums named, respectively, is hereby appropriated, out of any money in the Treasury not otherwise appropriated, and the other half out of the revenues of the District of Columbia, in full for the purposes following, being for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and eight, namely:

District of Columbia appropriations.
Half from District revenues.

* * * * *

IMPROVEMENTS AND REPAIRS.

Improvements and repairs.

* * * * *

Aqueduct Bridge: For reconstruction of pier numbered one of the Aqueduct Bridge across the Potomac River at Georgetown, District of Columbia, to be expended under the direction of the Secretary of War, eighty thousand dollars; and the unexpended balance, amounting to about fourteen thousand dollars, of the appropriations for the reconstruction of piers numbered four and five of said bridge is hereby reappropriated and made available for the periodical examination of the remaining piers of the bridge and making of such repairs as may be found necessary.

Aqueduct Bridge.

Highway bridge across Potomac River: For salaries of two draw operators, at one thousand and twenty dollars each; three watchmen, at six hundred dollars each; for labor, one thousand five hundred dollars; and for lighting, power, and miscellaneous supplies, and expenses of every kind necessarily incident to the operation and maintenance of the bridge and approaches, ten thousand six hundred and sixty dollars; in all, sixteen thousand dollars.

Highway bridge.

* * * * *

WASHINGTON AQUEDUCT.

Washington Aqueduct.

For operation, including salaries of all necessary employees, maintenance, and repair of the aqueduct and its accessories, including Conduit road, the Washington City reservoir, and Washington Aqueduct tunnel, and also including the purchase and maintenance of horses, vehicles, and harness, and the care and maintenance of the stable, thirty-three thousand dollars.

Maintenance.

For purchase of a dredge and accessories for removing sediment from Dalecarlia reservoir, thirty thousand dollars.

Dredge for Dalecarlia reservoir.

Removal of sediment.

For removal by dredging of about one hundred and thirty-four thousand cubic yards of sediment from Dalecarlia reservoir, sixteen thousand dollars.

Riprapping.

For riprapping four hundred linear feet of the shore of Dalecarlia reservoir in order to protect the biconduit, two thousand dollars.

For riprapping the sides of the Dalecarlia reservoir for a width of about twenty feet, eighteen thousand dollars.

Washington City reservoir.

For parking the grounds at the Washington City reservoir, three thousand dollars.

Salaries, etc.

For care, including salaries of all necessary employees, maintenance, and operation of the Washington Aqueduct, District of Columbia, filtration plant, and for each and every purpose connected therewith, ninety thousand dollars.

* * * * *

SEC. 8. That all laws and parts of laws to the extent that they are inconsistent with this Act are repealed.

Approved, March 2, 1907.

March 2, 1907. [H. R. 23551.] [Public No. 170.] Vol. 34, pp. 1158, 1161, 1163, 1167, 1173.

CHAP. 2511.—An Act Making appropriation for the support of the Army for the fiscal year ending June thirtieth, nineteen hundred and eight.

Army appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and they are hereby, appropriated, out of any money in the Treasury not otherwise appropriated, for the support of the Army for the year ending June thirtieth, nineteen hundred and eight:

* * * * *

Clerks, etc.

PAY TO CLERKS, MESSENGERS, AND LABORERS AT HEADQUARTER OF DIVISIONS, AND DEPARTMENTS AND OFFICE OF THE CHIEF OF STAFF.

* * * * *

Proviso. Assignment to duty in War Department forbidden.

* * * *Provided*, That no clerk, messenger, or laborer at headquarters of divisions, departments, or office of the Chief of Staff, shall be assigned to duty with any bureau in the War Department.

* * * * *

Retired officers.

RETIRED OFFICERS.

Proviso. Retirement of brigadier-generals having civil war service.

* * * *Provided*, That officers who served creditably in the regular or volunteer forces during the civil war prior to April ninth, eighteen hundred and sixty-five, and who now hold the rank of brigadier-general on the active list of the Army, having previously held that rank for three years or more, shall, when retired from active service, have the rank and retired pay of major-general.

* * * * *

QUARTERMASTER'S DEPARTMENT.

Quartermaster's Department.

* * * * *

For the purchase of the necessary instruments, office furniture, stationery, and other authorized articles required for the equipment and use of the officers' schools at the several military posts, ten thousand dollars.

Equipment of post schools.

* * * * *

ENGINEER DEPARTMENT.

Engineer Department.

ENGINEER DEPOTS: For incidental expenses of the depots, including fuel, lights, chemicals, stationery, hardware, machinery, pay of civilian clerks, mechanics, and laborers, extra-duty pay to soldiers necessarily employed for periods not less than ten days as artificers on work in addition to and not strictly in the line of their military duties, such as carpenters, blacksmiths, draftsmen, printers, lithographers, photographers, engine drivers, telegraph operators, teamsters, wheelwrights, masons, machinists, painters, overseers, laborers; repairs of and for materials to repair public buildings, machinery, and unforeseen expenses, eleven thousand five hundred dollars.

Incidental expenses of depots.

For purchase and repair of instruments to be issued to officers of the Corps of Engineers and to officers detailed and on duty as acting engineer officers for use on public works and surveys, five thousand dollars.

Purchase, etc., of instruments.

Engineer School, Washington, District of Columbia: Equipment and maintenance of the Engineer School of Application at Washington Barracks, District of Columbia, including purchase of instruments, machinery, implements, models, and materials, for the use of the school and for instruction of engineer troops in their special duties as sappers and miners; for land mining, pontoniering, and signaling; for purchase and binding of professional works of recent date treating of military and civil engineering and kindred scientific subjects for the library of the United States Engineer School; for incidental expenses of the school, including fuel, lights, chemicals, stationery, hardware, machinery, and boats; for pay of civilian clerks, draftsmen, electricians, mechanics, and laborers; for extra-duty pay to soldiers necessarily employed for periods not less than ten days as artificers on work in addition to and not strictly in the line of their military duties, such as carpenters, blacksmiths, draftsmen, printers, lithographers, photographers, engine drivers, telegraph operators, teamsters, wheelwrights, masons, machinists, painters, overseers, laborers; for repairs of and materials to repair public buildings, and machinery; for unforeseen expenses, for travel expenses of officers on journeys approved by the Chief of Engineers and made for the purpose of instruction: *Provided*, That the traveling expenses herein provided for shall be in lieu of mileage and other allowances; and to provide means for the

Engineer School, Washington, D. C. Equipment, etc.

Incidental expenses.

Proviso. Traveling expenses allowance.

theoretical and practical instruction at the Engineer School by the purchase of text-books, books of reference, scientific and professional papers, and for other absolutely necessary expenses, twenty-five thousand dollars.

Buildings.

BUILDINGS, ENGINEER SCHOOL, WASHINGTON, DISTRICT OF COLUMBIA: For completion of two incomplete sets of noncommissioned officers' quarters, fifteen thousand dollars.

For construction of one new stable, seventeen thousand five hundred dollars.

Equipment of troops. Materials.

ENGINEER EQUIPMENT OF TROOPS: For pontoon material, tools, instruments, and supplies required for use in the engineer equipment of troops, including the purchase and preparation of engineer manuals, forty thousand dollars.

Services.

For services of surveyors, draftsmen, photographers, master laborers, and clerks to engineer officers on the staff of division, corps, and department commanders, twenty-five thousand dollars.

Total for Engineer Department, one hundred and thirty-nine thousand dollars.

* * * * *

Approved, March 2, 1907.

March 2, 1907. [S. 3638.] [Public, No. 174.] Vol. 34, p. 1217.

CHAP. 2515.—An Act Providing for the retirement of noncommissioned officers, petty officers, and enlisted men of the Army, Navy, and Marine Corps of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That when an enlisted man shall have served thirty years either in the Army, Navy, or Marine Corps, or in all, he shall, upon making application to the President, be placed upon the retired list, with seventy-five per centum of the pay and allowances he may then be in receipt of, and that said allowances shall be as follows: Nine dollars and fifty cents per month in lieu of rations and clothing and six dollars and twenty-five cents per month in lieu of quarters, fuel, and light: *Provided*, That in computing the necessary thirty years' time all service in the Army, Navy, and Marine Corps shall be credited.

Retired enlisted men.

Additional allowances to.

Proviso. Credit for all service.

Repeal.

SEC. 2. That all Acts and parts of Acts, so far as they conflict with the provisions of this Act, are hereby repealed.

Approved, March 2, 1907.

March 2, 1907. [S. 8128.] [Public, No. 178.] Vol. 34, p. 1219.

CHAP. 2519.—An Act Granting to the Saint Johns Light and Power Company a right of way for street railroad purposes through the United States Military Reservation of Fort Marion in Saint Augustine, Florida, and through other Government property in said city.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assem-

bled, That there is hereby granted to the Saint Johns Light and Power Company, a corporation organized and existing under the laws of the State of Florida, and its successors and assigns, authority to construct, maintain, and operate a street railroad, to be operated by electricity or other motive power, over and through the United States Military Reservation of Fort Marion, and over and through such part of Orange street known as "the lines," the title of which may be in the Government, in the county of Saint Johns and city of Saint Augustine, on such lines and location as may be approved by the Secretary of War.

Fort Marion Military Reservation, Fla.
St. Johns Light and Power Company granted right of way through.
Location, etc., to be approved by Secretary of War.

SEC. 2. That said right of way hereby granted to the Saint Johns Light and Power Company shall be subject to termination by the Secretary of War upon sixty days previous notice; and if said company shall fail or refuse to remove its tracks, poles, wires, and other structures and appurtenances from the reservation within said period of sixty days after notification so to do, then and in that event the Secretary of War may cause the same to be removed at the expense of the said company and without liability to damages therefor.

Notice of termination.
Removal of tracks, etc.

SEC. 3. That said company shall pay such reasonable annual rental for such right of way and at such time as may be fixed by the Secretary of War.

Rent.

SEC. 4. That no structure other than said railroad and the necessary poles and wires for the operation of the same shall be placed upon said right of way hereby granted without first being approved by the Secretary of War.

Restriction.

Approved, March 2, 1907.

CHAP. 2520.—An Act To amend an Act entitled "An Act permitting the building of a dam across the Mississippi River in the county of Morrison, State of Minnesota," approved June fourth, nineteen hundred and six.

March 2, 1907.
[S. 8377.]
[Public, No. 179.]
Vol. 34, p. 1219.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section one of an Act entitled "An Act permitting the building of a dam across the Mississippi River in the county of Morrison, State of Minnesota," approved June fourth, nineteen hundred and six, be, and the same is hereby, amended so as to read as follows:

Mississippi River.
Time extended to The Pike Rapids Power Company to dam, in Morrison County, Minn.
Location.
Vol. 34, p. 209, amended.

"SECTION 1. That the consent of Congress is hereby granted to the Pike Rapids Power Company, a Minnesota corporation, its successors or assigns, to construct and maintain across the Mississippi River a dam, canal, and works necessary incident thereto for water power and supply purposes at a point between sections twenty,

twenty-nine, and thirty-two in township one hundred and twenty-eight north, range twenty-nine west of the fifth principal meridian, and sections seventeen and twenty, in township thirty-nine, range thirty-two west of the fourth principal meridian, in Morrison County, Minnesota: *Provided*, That the plans for the construction of said dam and appurtenant works shall be submitted to and approved by the Chief of Engineers and the Secretary of War before the commencement of the construction of the same: *And provided further*, That the said the Pike Rapids Power Company, its successors or assigns, shall not deviate from such plans after such approval, either before or after the completion of said structures, unless the modifications of such plans shall have previously been submitted to and received the approval of the Chief of Engineers and of the Secretary of War: *And provided further*, That there shall be placed and maintained in connection with said dam a sluiceway so arranged as to permit logs, timber, and lumber to pass around, through, and over said dam without unreasonable delay or hinderance [*sic*] and without toll or charges: *And provided further*, That the dam shall be so constructed that the Government of the United States may at any time construct in connection therewith a suitable lock for navigation purposes, and may at any time, without compensation, control the said dam so far as shall be necessary for the purposes of navigation, but shall not destroy the water power developed by said dam and structures to any greater extent than may be necessary to provide proper facilities for navigation, and that the Secretary of War may at any time require and enforce, at the expense of the owners, such modifications and changes in the construction of said dam as he may deem advisable in the interests of navigation."

Provisos. Secretary of War to approve plans, etc.

Changes.

Sluiceway.

Lock.

SEC. 2. That section four of said Act above referred to be, and the same is hereby, amended so as to read as follows:

"SEC. 4. That the right to amend, alter, or repeal this Act is hereby expressly reserved, and the same shall become null and void unless the construction of the dam hereby authorized is commenced within one year from June first, nineteen hundred and seven, and completed within three years thereafter, and that except so far as may be otherwise provided in this Act, the provision of the Act of Congress entitled 'An Act to regulate the construction of dams over navigable waters,' approved on the twenty-first day of June, nineteen hundred and six, shall be applicable to the construction of the dam provided in this Act."

Time of construction. Vol. 34, p. 210, amended.

Vol. 34, p. 386.

Approved, March 2, 1907.

CHAP. 2541.—An Act To authorize the Burnwell Coal and Coke Company to construct a bridge across the Tug Fork of Big Sandy River.

March 2, 1907. [H. R. 25611.]

[Public, No. 200.]

Vol. 34, p. 1234.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Burnwell Coal and Coke Company, a corporation organized under the laws of the State of West Virginia, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad, tramroad, conveyor, wagon, or foot bridge and approaches thereto across the Tug Fork of Big Sandy River at a point about one and one-half miles west of Hatfield Tunnel, near Sprigg, Mingo County, West Virginia, where the same forms the boundary line between the States of Kentucky and West Virginia, in the State of West Virginia, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Tug Fork of Big Sandy River.

Burnwell Coal and Coke Company may bridge, in West Virginia.

Location.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 2, 1907.

CHAP. 2542.—An Act To authorize the county of Armstrong, in the State of Pennsylvania, to construct a bridge across the Allegheny River in Armstrong County, Pennsylvania.

March 2, 1907. [H. R. 25627.]

[Public, No. 201.]

Vol. 34, p. 1234.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the county of Armstrong, in the State of Pennsylvania, a municipal corporation under the laws of Pennsylvania, its successors and assigns, be, and it is hereby, authorized to construct, maintain, and operate a bridge and approaches thereto across the Allegheny River, from a point on the Bonnett road, near a derrick erected by the Pittsburg Plate Glass Company, in North Buffalo Township, Armstrong County, Pennsylvania, to a point on the public road leading from Rosston to Kittanning, near the old landing of Midway Ferry, in the borough of Ford City, in said county and State, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Allegheny River, Pa.

Armstrong County may bridge.

Location.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 2, 1907.

March 2, 1907. [H. R. 25671.]

[Public, No. 202.]

Vol. 34, p. 1234.

CHAP. 2543.—An Act To authorize the construction of a bridge across the Grand Calumet River, State of Illinois.

Grand Calumet River, Ill. Chicago Terminal Transfer Railroad Company may bridge. Location.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Chicago Terminal Transfer Railroad Company, a corporation organized under the laws of the State of Illinois, its successors and assigns, be, and they are hereby, authorized to construct a railroad bridge and approaches thereto across the Grand Calumet River at a point in the south half of the southwest quarter of fractional section five, township thirty-six north, range fifteen east of the third principal meridian, about one-half mile west of the boundary line between the States of Indiana and Illinois, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 2, 1907.

March 2, 1907. [H. R. 25691.]

[Public, No. 203.]

Vol. 34, p. 1235.

CHAP. 2544.—An Act To authorize the construction of a bridge across the Monongahela River, in the State of Pennsylvania, by the Liberty Bridge Company.

Monongahela River. Liberty Bridge Company may bridge, at Pittsburg, Pa.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Liberty Bridge Company, a corporation created and organized under the laws of the State of Pennsylvania, its successors and assigns, be, and it is hereby, authorized to construct and maintain a bridge and approaches thereto over the Monongahela River, in the city of Pittsburg, State of Pennsylvania, in accordance with the provisions of the Act of Congress approved March twenty-third, nineteen hundred and six, entitled "An Act to regulate the construction of bridges over navigable waters."

Vol. 34, p. 84.

Construction.

SEC. 2. That this Act shall be null and void if actual construction of the bridge herein authorized be not commenced within one year and completed within three years from the date of the approval of this Act.

Amendment.

SEC. 3. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 2, 1907.

March 2, 1907. [H. R. 25716.]

[Public, No. 204.]

Vol. 34, p. 1235.

CHAP. 2545.—An Act To amend an Act entitled "An Act permitting the building of a dam across the Mississippi River above the village of Monticello, Wright County, Minnesota," approved June fourteenth, nineteen hundred and six.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assem-

bled, That section three of an Act entitled "An Act permitting the building of a dam across the Mississippi River above the village of Monticello, Wright County, Minnesota," approved June fourteenth, nineteen hundred and six, be, and the same is hereby, amended so as to read as follows:

Mississippi River. Time extended for dam, above Monticello, Minn.

"SEC. 3. That this Act shall be null and void unless the construction of the dam hereby authorized is commenced within one year from June fourteenth, nineteen hundred and seven, and completed within three years thereafter."

Time of construction. Vol. 34, p. 265, amended.

Approved, March 2, 1907.

CHAP. 2546.—An Act To amend an Act entitled "An Act permitting the building of a dam across the Mississippi River at or near the village of Clearwater, Wright County, Minnesota," approved June fourteenth, nineteen hundred and six.

March 2, 1907. [H. R. 25717.] [Public, No. 205.] Vol. 34, p. 1235.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section three of an Act entitled "An Act permitting the building of a dam across the Mississippi River at or near the village of Clearwater, Wright County, Minnesota," approved June fourteenth, nineteen hundred and six, be, and the same hereby is, amended so as to read as follows:

Mississippi River. Time extended for dam, at Clearwater, Minn.

"SEC. 3. That this Act shall be null and void unless the construction of the dam hereby authorized is commenced within one year from June fourteenth, nineteen hundred and seven, and completed within three years thereafter."

Time of construction. Vol. 34, p. 267, amended.

Approved, March 2, 1907.

CHAP. 2547.—An Act To amend an Act entitled "An Act to authorize the Fayette Bridge Company to construct a bridge over the Monongahela River, Pennsylvania, from a point in the borough of Brownsville, Fayette County, to a point in the borough of West Brownsville, Washington County," approved April twenty-third, nineteen hundred and six.

March 2, 1907. [H. R. 25769.] [Public, No. 206.] Vol. 34, p. 1236.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section seven of an Act entitled "An Act to authorize the Fayette Bridge Company to construct a bridge over the Monongahela River, Pennsylvania, from a point in the borough of Brownsville, Fayette County, to a point in the borough of West Brownsville, Washington County," approved April twenty-third, nineteen hundred and six, be, and is hereby, amended to read as follows:

Monongahela River, Pa. Time extended for bridging, by Fayette Bridge Company.

"SEC. 7. That this Act shall be null and void unless the construction of said bridge shall be commenced within

Time of construction. Vol. 34, p. 130, amended.

one year from April twenty-third, nineteen hundred and seven, and shall be completed by April twenty-third, nineteen hundred and ten."

Approved, March 2, 1907.

March 2, 1907. [H. R. 25758.] [Public, No. 207.] Vol. 34, pp. 1236, 1237, and 1238.

CHAP. 2548.—An Act Amending an Act entitled "An Act to increase the limit of cost of certain public buildings, to authorize the purchase of sites for public buildings, to authorize the erection and completion of public buildings, and for other purposes," and for other purposes.

Public buildings. Quarters for all branches of services to be provided in, authorized by omnibus act. Vol. 34, p. 772.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be the duty of the Secretary of the Treasury, and he is hereby directed, in constructing the public buildings authorized under the provisions of the Act approved June thirtieth, nineteen hundred and six, entitled "An Act to increase the limit of cost of certain public buildings, to authorize the purchase of sites for public buildings, to authorize the erection and completion of public buildings, and for other purposes," to provide quarters, so far as may be practicable, for all the branches of the Government service in the town or city where such building or buildings are to be erected: *Provided*, That any and all changes or alterations made under the foregoing authority shall be made within the limit of cost heretofore fixed by law for the construction of such buildings.

Proviso. Changes, etc.

* * * * *

Washington, D. C. Sale of land between Anacostia River and squares 1131, 1117, 1123, 1148, and 1149.

SEC. 13. That the Secretary of War be, and he is hereby, authorized and directed to convey to the purchaser from the United States of square eleven hundred and thirty-one, and the south part of square eleven hundred and seventeen, and the squares south of squares eleven hundred and twenty-three, eleven hundred and forty-eight, and eleven hundred and forty-nine, in the city of Washington, all the interest of the United States in the land lying south of the squares so purchased and between them and the channel of the Anacostia River, upon the payment by such purchaser into the Treasury of the United States of such sum of money as the said Secretary of War, upon consideration of all the circumstances, shall determine proper to be paid for the said land; and the surveyor of the District of Columbia is hereby authorized and directed to mark out such land and determine the acres and to record a plat thereof.

Plat, etc.

* * * * *

Repeal.

SEC. 16. That all Acts or parts of Acts in conflict herewith are hereby repealed.

Approved, March 2, 1907.

CHAP. 2549.—An Act Permitting the building of a dam across the Savannah River at McDaniel Shoals.

March 2, 1907.
[H. R. 25773.]

[Public, No. 208.]
Vol. 34, p. 1238.

Savannah River.
Anderson Guaranty and Trust Company may dam, at McDaniel shoals.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Anderson Guaranty and Trust Company, a corporation organized under the laws of South Carolina, its successors and assigns, is hereby authorized to construct and maintain a dam across the Savannah River extending from a point in Hart County, Georgia, to a point in Anderson County, South Carolina, upon or in the vicinity of McDaniel Shoals, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Vol. 34, p. 386.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 2, 1907.

CHAP. 2550.—An Act Permitting the building of a dam across the Savannah River at Turner Shoals.

March 2, 1907.
[H. R. 25774.]

[Public, No. 209.]
Vol. 34, p. 1239.

Savannah River.
Anderson Guaranty and Trust Company may dam, at Turner shoals.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Anderson Guaranty and Trust Company, a corporation organized under the laws of South Carolina, its successors and assigns, is hereby authorized to construct and maintain a dam across the Savannah River extending from a point in Elbert County, Georgia, to a point in Abbeville County, South Carolina, upon or in the vicinity of Turner Shoals, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Vol. 34, p. 386.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 2, 1907.

CHAP. 2551.—An Act Permitting the building of a dam across the Savannah River at Middleton Shoals.

March 2, 1907.
[H. R. 25776.]

[Public, No. 210.]
Vol. 34, p. 1239.

Savannah River.
Anderson Guaranty and Trust Company may dam, at the Middleton shoals.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Anderson Guaranty and Trust Company, a corporation organized under the laws of South Carolina, its successors and assigns, is hereby authorized to construct and maintain a dam across the Savannah River extending from a point in Elbert County, Georgia, to a

point in Anderson County, South Carolina, upon or in the vicinity of Middleton Shoals, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Vol. 34, p. 386.

Amendment.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Approved, March 2, 1907.

March 2, 1907. [H. R. 25795.] [Public, No. 211.] Vol. 34, p. 1239.

CHAP. 2552.—An Act To authorize the Pensacola and Northeastern Railroad Company, a corporation existing under the laws of the State of Florida, to construct a bridge over the Escambia River between the counties of Santa Rosa and Escambia, in the State of Florida.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Pensacola and Northeastern Railroad Company, a corporation existing under the laws of the State of Florida, be, and is hereby, authorized to construct, operate, and maintain a bridge over the Escambia River between the counties of Escambia and Santa Rosa, in the State of Florida, at such point between the mouth of said river and the Alabama State line to be approved by the Secretary of War, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Escambia River, Fla.

Pensacola and Northeastern Railroad Company may bridge.

Location.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, and repeal this Act is hereby expressly reserved.

Approved, March 2, 1907.

March 2, 1907. [H. R. 25846.] [Public, No. 212.] Vol. 34, p. 1240.

CHAP. 2553.—An Act Permitting the building of a dam across the Savannah River at Calhoun Falls.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Hugh MacRae Company, a corporation organized under the laws of South Carolina, its successors and assigns, is hereby authorized to construct and maintain a dam across the Savannah River extending from a point in Elbert County, Georgia, to a point in Abbeville County, South Carolina, upon or in the vicinity of Calhoun Falls, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Savannah River.

Hugh MacRae Company may dam, at Calhoun Falls.

Vol. 34, p. 386.

Amendment.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Approved, March 2, 1907.

CHAP. 2554.—An Act Permitting the building of a dam across the Savannah River at Hattons Ford.

March 2, 1907. [H. R. 25847.]

[Public, No. 213.]

Vol. 34, p. 1240.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Hugh MacRae Company, a corporation organized under the laws of South Carolina, its successors and assigns, is hereby authorized to construct and maintain a dam across the Savannah River, extending from a point in Hart County, Georgia, to a point in Anderson County, South Carolina, upon or in the vicinity of Hattons Ford, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Savannah River. Hugh MacRae Company may dam, at Hattons Ford.

Vol. 34, p. 386.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 2, 1907.

CHAP. 2555.—An Act Permitting the building of a dam across the Savannah River at Andersonville Shoals.

March 2, 1907. [H. R. 25848.]

[Public, No. 214.]

Vol. 34, p. 1240.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the J. R. Earle Development Company, a corporation to be organized under the laws of South Carolina, its successors and assigns, is hereby authorized to construct and maintain a dam across the Savannah River, extending from a point in Hart County, Georgia, to a point in Anderson County, South Carolina, upon or in the vicinity of Andersonville Shoals, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Savannah River. J. R. Earle Development Company may dam, at Andersonville shoals.

Vol. 34, p. 386.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 2, 1907.

CHAP. 2556.—An Act Permitting the building of a dam across the Savannah River at Trotters Shoal.

March 2, 1907. [H. R. 25850.]

[Public, No. 215.]

Vol. 34, p. 1241.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Hugh MacRae Company, a corporation organized under the laws of South Carolina, its successors and assigns, is hereby authorized to construct and maintain a dam across the Savannah River extending from a point in Elbert County, Georgia, to a point in

Savannah River. Hugh MacRae Company may dam, at Trotters shoals.

Abbeville County, South Carolina, upon or in the vicinity of Trotters Shoals, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Vol. 34, p. 386.

Amendment.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Approved, March 2, 1907.

March 2, 1907. [H. R. 24605.]

[Public, No. 229.]

Vol. 34, p. 1249.

CHAP. 2570.—An Act Granting to the Norfolk and Portsmouth Traction Company the right to operate trains through the military reservation on Willoughby Spit, Norfolk County, Virginia.

Willoughby Spit, Va.

Norfolk and Portsmouth Traction Company granted right of way through military reservation on.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Norfolk and Portsmouth Traction Company, lessee of the Norfolk Railway and Light Company, be, and it is hereby, granted the license and privilege to maintain and operate its electric railway, which has heretofore been constructed under a license granted by the Secretary of War to its predecessor, the Norfolk, Willoughby Spit and Old Point Railroad Company, across the military reservation of the United States on Willoughby Spit, in Norfolk County, Virginia, on such location as may be approved by the Secretary of War upon the following conditions, namely:

Location to be approved by Secretary of War.

Conditions.

Removal of tracks.

First. That the said company, its successors or assigns, shall remove its tracks, at its own expense, from said reservation within sixty days after receiving notice from the Secretary of War that the War Department requires the premises so occupied for the purposes of the United States; and upon the failure, neglect, or inability of the said company, its successors or assigns, so to do, the same shall become the property of the United States, and the United States may then cause the same to be removed at said company's expense, and no claims for damages against the United States, or any officer or agent therefor, shall be created by or made on account of such removal.

Restrictions.

Second. That said company shall confine its route to the location heretofore adopted under the license granted by the Secretary of War; and that there shall be built no structures along the line of the road; that the road shall be fenced in a manner satisfactory to the Chief of Engineers; and that no more trees shall be cut down than in the judgment of the local officer of the Corps of Engineers are necessary to clear a way for the tracks.

Free transportation for United States officers, etc.

Third. That the said company shall carry free over any part or parts of its road and ferry all United States officers, engineers, inspectors, overseers, clerks, and laborers dwelling beyond the limits of the reservation or Ocean

View, who may be engaged in Government work upon the reservation.

Fourth. That said company shall pay all taxes assessed against the property. Taxes.

Fifth. That any sum which may have to be expended after the revocation of this license, as heretofore provided, in putting the premises or property hereby authorized to be occupied or used, in as good condition for use by the United States as it is at the date of the granting of said license, shall be repaid by the said company on demand. Restoring property to former condition. Payment of cost.

Sixth. That said company shall pay such reasonable annual rental as may be fixed from time to time by the Secretary of War. Rent.

Approved, March 2, 1907.

CHAP. 2576.—An Act To authorize the Cairo and Tennessee River Railroad Company to construct a bridge across the Tennessee River.

March 2, 1907. [H. R. 25738.] [Public, No. 235.] Vol. 34, p. 1253.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Cairo and Tennessee River Railroad Company, a corporation organized under the laws of the States of Tennessee and Kentucky, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad bridge and approaches thereto across the Tennessee River, between Brandon's mill, in Calloway County, and Birmingham, Marshall County, in the State of Kentucky, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six. Tennessee River, Ky. Cairo and Tennessee River Railroad Company may bridge. Location. Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved. Amendment.

SEC. 3. That the Act of Congress approved March ninth, nineteen hundred and six, entitled "An Act to authorize the Cairo and Tennessee Railroad Company to construct a bridge across the Tennessee River," is hereby repealed. Former act repealed. Vol. 34, p. 56.

Approved, March 2, 1907.

CHAP. 2577.—An Act To authorize the Cairo and Tennessee River Railroad Company to construct bridges across Cumberland River.

March 2, 1907. [H. R. 25739.] [Public, No. 236.] Vol. 34, p. 1254.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Cairo and Tennessee River Railroad Company, a corporation organized under the laws of the States of Tennessee and Kentucky, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad bridge and approaches thereto, across the Cumberland River between Lineport, Stewart Cumberland River, Tenn. and Ky. Cairo and Tennessee River Railroad Company may construct two bridges across. Locations.

County, Tennessee, and the Tennessee Rolling Works, Lyon County, Kentucky, and also to construct a bridge across said Cumberland River, between Celina, in Clay County, Tennessee, and Bakertown, Cumberland County, in the State of Kentucky, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Former law repealed.

Vol. 34, p. 58.

SEC. 3. That the Act of Congress approved March ninth, nineteen hundred and six, entitled "An Act to authorize the Cairo and Tennessee River Railroad Company to construct a bridge across Cumberland River," is hereby repealed.

Approved, March 2, 1907.

March 2, 1907. [H. R. 25811.] [Public, No. 237.] Vol. 34, p. 1254.

CHAP. 2578.—An Act To authorize the Monroe, Farmerville and Northwestern Railway Company to construct a bridge over the Ouachita River and one over the D'Arbonne River, in Louisiana.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Monroe, Farmerville and Northwestern Railroad Company, a corporation organized under the laws of the State of Louisiana, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad bridge and approaches thereto, across the Ouachita River at or near Monroe, also a bridge across the D'Arbonne River at or near Farmerville, in the State of Louisiana, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Ouachita and D'Arbonne rivers, La.

Monroe, Farmerville and Northwestern Railway Company may bridge, at Monroe and Farmerville.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 2, 1907.

March 2, 1907. [H. R. 25832.] [Public, No. 238.] Vol. 34, p. 1254.

CHAP. 2579.—An Act To authorize Herman L. Hartenstein to construct a dam across the Saint Joseph River, near the village of Mottville, Saint Joseph County, Michigan.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Herman L. Hartenstein, a citizen of the State of Michigan, his heirs and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across the Saint Joseph River, at any point up the stream within one mile from the highway bridge at the village of Mottville, Saint Joseph County, in the State

St. Joseph River, Mich.

Herman L. Hartenstein may dam, at Mottville.

of Michigan, in accordance with the provisions of the Act entitled An "Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Vol. 34, p. 386.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 2, 1907.

CHAP. 2580.—An Act Permitting the building of a dam across the Savannah River at Cherokee Shoals.

March 2, 1907. [H. R. 25849.]

[Public, No. 239.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Hugh MacRae Company, a corporation organized under the laws of South Carolina, its successors and assigns, is hereby authorized to construct and maintain a dam across the Savannah River extending from a point in Elbert County, Georgia, to a point in Abbeville County, South Carolina, upon or in the vicinity of Cherokee Shoals, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of an Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six.

Vol. 34, p. 1255.

Savannah River, Ga. and S. C.

Hugh MacRae Company may dam, at Cherokee shoals.

Vol. 34, p. 386.

SEC. 2. That the right to amend or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 2, 1907.

CHAP. 2581.—An Act To extend the time for building a bridge across Red River at Shreveport, Louisiana.

March 2, 1907. [H. R. 25885.]

[Public, No. 240.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section five of the Act of Congress approved February second, nineteen hundred and six, entitled "An Act to authorize the construction of a bridge across Red River at Shreveport, Louisiana," be, and is hereby, amended to read as follows:

Vol. 34, p. 1255.

Red River.

Time extended for bridging, by Shreveport, La.

"SEC. 5. That this Act shall be null and void if actual construction of the bridge herein authorized be not commenced within one year and completed within three years from February third, nineteen hundred and seven."

Time of construction.

Vol. 34, p. 9, amended.

Approved, March 2, 1907.

[No. 18.] Joint Resolution Authorizing the wearing of the distinctive badge adopted by the Army and Navy Union upon all occasions of ceremony.

March 2, 1907. [H. J. R. 31.]

[Pub. Res., No. 18.]

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,

Vol. 34, p. 1423.

Army and Navy Union. Officers, etc., may wear distinctive badge.

That the distinctive badge adopted by the Army and Navy Union of the United States may be worn, in their own right, upon all public occasions of ceremony by officers and enlisted men of the Army and Navy of the United States who are members of said organization.

Approved, March 2, 1907.

March 4, 1907. [S. 8189.]

[Public, No. 244.]

Vol. 34, p. 1283.

CHAP. 2909.—An Act Granting to the Saint Louis, Iron Mountain and Southern Railway Company, a corporation, the right to construct, maintain, and operate a single track railway across the lands of the United States in the southeast quarter of the northeast quarter of section twenty-one, township fourteen north, range six west of the fifth principal meridian, in the county of Independence and State of Arkansas, reserved for use in connection with the construction of Lock Numbered One, Upper White River, Arkansas.

Upper White River, Ark. St. Louis, Iron Mountain and Southern Railway Company granted right of way through land reserved for Lock No. 1.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Saint Louis, Iron Mountain and Southern Railway Company, a corporation, created and existing under and by virtue of the laws of the State of Arkansas, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a single track railway over and across the lands of the United States in the southeast quarter of the northeast quarter of section twenty-one, township fourteen north, range six west of the fifth principal meridian, in the county of Independence and State of Arkansas, reserved for use in connection with the construction of Lock Numbered One, Upper White River, Arkansas, subject to such conditions as may be prescribed by the Secretary of War and he may require the said company to pay to the United States such sum of money as he may decide to be the value of the land so occupied and compensation for any other injury sustained by the United States. Said Saint Louis, Iron Mountain and Southern Railway Company shall not use the river banks within a distance of eight hundred feet above and below the limits of the lock walls of said Lock Numbered One nor any area within the boundaries of the aforesaid lands, as a place for depositing spoil and waste, except under such conditions as may be approved by the Secretary of War.

Compensation. Restriction.

Secretary of War to approve plans, etc.

SEC. 2. That the said Saint Louis, Iron Mountain and Southern Railway shall not avail themselves of the privileges of this Act until the Secretary of War shall have approved the location and plans of the single track railway referred to in Section one of this Act: *Provided*, That the center line of said track shall be at least seventy-five feet from, and on the northerly side of, the lock tender's cottage now built on the aforesaid lands: *And provided further*, That if, in the construction of the said railway, it is necessary to remove any buildings, barns, water towers, or other structures now on the aforesaid lands, the

Provisos.

Location of track.

Removal of structures, etc.

Saint Louis, Iron Mountain and Southern Railway Company shall replace them at points to be designated by the Secretary of War and in like condition and repair as when taken: *And provided further*, That in the construction, maintenance, and operation of said single track railway, the Saint Louis, Iron Mountain and Southern Railway Company shall not appropriate any land other than that needed for the roadway, and said construction, maintenance, and operation through said lands shall at all times be under the supervision of the Secretary of War.

Restriction.

SEC. 3. That all railroad companies desiring the use of the single track railway authorized by this Act shall have and be entitled to equal rights and privileges relative to the passage of railway trains or cars over the same, and over the approaches thereto, upon the payment of a reasonable compensation for such use; and in case the owners of the said single track railway and the several railroad companies, or any of them, desiring such use shall fail to agree upon the sum or sums to be paid, and upon the rules and conditions to which each shall conform, all matters at issue between them shall be decided by the Secretary of War.

Use by other roads.

Compensation.

SEC. 4. That this Act shall be null and void if actual construction of said single track railway herein authorized shall not be commenced in one year and completed within two years from the date of the approval hereof.

Time of construction.

SEC. 5. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 4, 1907, 10 a. m.

CHAP. 2912.—An Act Permitting the erection of a dam across Coosa River, Alabama, at the place selected for Lock Numbered Twelve on said river.

March 4, 1907.
[S. 8526.]
[Public, No. 247.]
Vol. 34, p. 1288.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby granted to the Alabama Power Company, a corporation organized under the laws of the State of Alabama, its successors and assigns, to build a dam, of such height as the Chief of Engineers and the Secretary of War may approve, across the Coosa River, in Alabama, at the place selected for the location of Lock and Dam Numbered Twelve on said river, as located in the survey made by the engineers of the United States of the Coosa and Alabama rivers in Georgia and Alabama, in compliance with the requirements of the river and harbor Act approved June thirteenth, nineteen hundred and two, for the development of water power, and such works and structures in connection therewith as may be necessary or convenient in the development of said power and in the utilization of the power thereby developed: *Provided*, That plans for the

Coosa River, Ala.

Alabama Power Company may dam.

Location.

Vol. 32, p. 353.

Proviso.

Secretary of War to approve plans, etc.

construction of said dam and appurtenant works shall be submitted to and approved by the Chief of Engineers and the Secretary of War before the commencement of the construction of the same: *Provided further*, That the Alabama Power Company, its successors or assigns, shall not deviate from such plans after such approval, either before or after the completion of said structures, unless the modification of said plans shall have previously been submitted to and received the approval of the Chief of Engineers and Secretary of War: *Provided further*, That said dam and appurtenant works shall be limited to the use of the surplus water only of the river not required for the navigation of the Coosa River, and that no structure shall be built and no operations conducted under the provisions of this Act which shall at any time injure or interfere with the navigation of said river or impair the usefulness of any improvement by the Government in the interests of navigation.

Changes.

Unobstructed navigation.

Locks.

SEC. 2. That the said dam shall be so constructed, including a proper forebay, that the Government of the United States may at any time construct in connection therewith a suitable lock or locks for navigation purposes, and may at any time, without compensation, control the said dam or other structures and the level of the pool caused by such dam so far as shall be necessary for purposes of navigation, but shall not destroy the water power developed by said dam and structures to any greater extent than may be necessary to provide proper facilities for navigation, and that the Secretary of War may at any time require and enforce, at the expense of the owners, such modifications and changes in the construction of such dam as may be necessary in the interest of navigation: *Provided*, That the Alabama Power Company, its successors or assigns, shall furnish the necessary electric current, while its power plant is in operation, to move the gates and operate the locks in connection with said dam and to light the United States buildings and grounds free of cost to the United States: *Provided further*, That the Alabama Power Company, its successors or assigns, is hereby granted the right to use any lands which may belong to the United States of America and necessary for the construction and maintenance of said dam and appurtenant works, or which may be inundated with water by reason of the construction of said dam and appurtenant works, and in consideration therefor the said company, its successors or assigns, shall, upon request of the Chief of Engineers and the Secretary of War, convey free of cost to the United States of America such suitable tract or tracts of land as may be selected by the Chief of Engineers and the Secretary of War for the establishment of such lock or locks and approaches and other purposes as the needs of navigation may require.

Changes.

Provisos.
Electric power.

Use of lands for construction, etc.

Conveyance of other lands to the United States.

Time of construction.

SEC. 3. That this Act shall be null and void unless the dam herein authorized be commenced within three years

and completed within seven years from the time of the passage of this Act.

SEC. 4. The authority herein conferred shall, except as herein specifically provided, be subject in all respects to the provisions of the Act entitled "An Act to regulate the construction of dams across navigable waters," approved June twenty-first, nineteen hundred and six. Vol. 34, p. 386.

SEC. 5. The right to alter, amend, or repeal this Act is hereby expressly reserved. Amendment.

Approved, March 4, 1907, 10 a. m.

CHAP. 2918.—An Act Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and eight, and for other purposes. March 4, 1907. [H. R. 25745.]

[Public, No. 253.]

Vol. 34, pp. 1295, 1335, 1341, 1349, 1350, 1351, 1371.

Sundry civil expenses appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and eight, namely:

* * * * *

For the continuation of the analyzing and testing of the coals, lignites, and other mineral fuel substances belonging to the United States, in order to determine their fuel value, and so forth, under the supervision of the Director of the United States Geological Survey, two hundred and fifty thousand dollars; Testing coals, etc.

Provided, That in examinations, hereby authorized, of fuel materials for the use of the Government of the United States, or for the purpose of increasing the general efficiency or available supply of the fuel resources in the United States, the Director of the Geological Survey may have the necessary materials collected from any part of the United States where they represent extensive deposits; and it shall be the duty of the Director of the Geological Survey to have examined, without charge, the fuels required for use by the Government of the United States, and to give these examinations preference over other work: *Provided further*, That in publishing the results of these investigations, the materials examined shall not be credited to any private party or corporation, but shall be collected and described as representing such extensive deposits; *Provisos.* Examinations. Publishing results.

* * * * *

War Department.

UNDER THE WAR DEPARTMENT.

* * * * *

Buildings and grounds, District of Columbia.

BUILDINGS AND GROUNDS IN AND AROUND WASHINGTON.

Improvement and care.

For improvement and care of public grounds, District of Columbia, as follows:

For improvement and maintenance of grounds south of Executive Mansion, four thousand dollars.

For ordinary care of greenhouses and nursery, two thousand dollars.

For ordinary care of Lafayette Park, two thousand dollars.

For ordinary care of Franklin Park, one thousand five hundred dollars.

For improvement and ordinary care of Lincoln Park, two thousand dollars.

Monument grounds.

For care and improvement of Monument grounds and annex (Potomac Park) to Monument grounds, seven thousand dollars.

Old canal.

For improvement, care, and maintenance of reservation numbered seventeen, and site of old canal northwest of same, two thousand five hundred dollars: *Provided*, That no part thereof shall be expended upon other than property belonging to the United States.

Proviso.

Expenditure.

For construction and repair of post-and-chain fences, repair of high iron fences, constructing stone coping about reservations, painting watchmen's lodges, iron fences, vases, lamps, and lamp-posts; repairing and extending water pipes, and apparatus for cleaning them; hose; manure, and hauling the same; removing snow and ice; purchase and repair of seats and tools; trees, tree and plant stakes, labels, lime, whitewashing, and stock for nursery, flower pots, twine, baskets, wire, splints, moss, and lycopodium, to be purchased by contract or otherwise, as the Secretary of War may determine; care, construction, and repair of fountains; abating nuisances, cleaning statues, and repairing pedestals, eighteen thousand five hundred and fifty dollars.

For improvement, care, and maintenance of various reservations, including purchase, maintenance, and driving of horse and vehicle for official use of the officer in charge of public buildings and grounds, and of other necessary vehicles, for official use, twenty-five thousand dollars.

For improvement, care, and maintenance of Smithsonian grounds, three thousand dollars.

For resurfacing asphalt roadways in the Smithsonian grounds, five thousand dollars.

For improvement and maintenance of Judiciary Park, two thousand five hundred dollars.

For laying cement and other walks in various reservations, two thousand dollars.

For broken-stone road covering for parks, three thousand five hundred dollars.

For curbing, coping, and flagging for park roads and walks, one thousand dollars.

Potomac Park.

For care and maintenance of that part of Potomac Park between the causeway of the Pennsylvania Railroad bridge, the Potomac River, and the tidal reservoir, four thousand dollars.

For care and maintenance of that part of Potomac Park along the north and west sides of the tidal reservoir, four thousand dollars.

Macadam roadway.

For constructing a macadam roadway along the west side of section two of Potomac Park, to extend from the inlet of the tidal reservoir to the foot of Twenty-sixth street northwest, and for improving the grounds on either side of same, in accordance with plans prepared in the office of public buildings and grounds, to be expended under the direction of the officer in charge of that office, of which sum fifteen thousand dollars shall be immediately available, eighty thousand dollars.

Causeway.

For completing improvement of that part of Potomac Park between the causeway of the Pennsylvania Railroad bridge, the Virginia channel of the Potomac River, and the tidal reservoir, due to changes in street car tracks and the erection of bridge across the outlet of the tidal reservoir into the Washington channel of the Potomac River, eight thousand dollars.

River drive.

For changing about eight hundred linear feet of the river drive in Monument Park annex (Potomac Park) from Fourteenth street to the Fifteenth street roadway, due to proposed change of grade on Fourteenth street and the opening up of Water street at that point, five thousand dollars.

Half from District revenues.

One half of the foregoing sums under "Buildings and grounds in and around Washington" shall be paid from the revenues of the District of Columbia and the other half from the Treasury of the United States.

Limit for concrete, etc., pavements.

Under appropriations herein contained no contract shall be made for making or repairing concrete or asphalt pavements in Washington City at a higher price than one dollar and eighty-five cents per square yard for a quality equal to the best laid in the District of Columbia prior to July first, eighteen hundred and eighty-six, and with a base of not less than six inches in thickness.

For improvement, care, and maintenance of grounds of Executive Departments, one thousand dollars.

For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Library of Congress as may be requested by the superintendent of the Library building, one thousand dollars.

For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Capitol as may be requested by the superintendent of the Capitol building, three thousand dollars.

For improvement and maintenance of Executive Mansion grounds (within iron fence), four thousand dollars.

For the employment of an engineer by the officer in charge of public buildings and grounds, two thousand four hundred dollars.

For purchase and repair of machinery and tools for shops at nursery, and for the repair of shops and storehouse, one thousand dollars.

Executive Mansion.

EXECUTIVE MANSION: For ordinary care, repair, and refurnishing of Executive Mansion, and for purchase, maintenance, and driving of horses and vehicles for official purposes, to be expended by contract or otherwise, as the President may determine, thirty-five thousand dollars.

For fuel for the Executive Mansion, greenhouses, and stable, six thousand dollars.

For care and maintenance of greenhouses, Executive Mansion, nine thousand dollars.

For repairs to greenhouses, Executive Mansion, three thousand dollars.

* * * * *

Lighting Executive Mansion and grounds.

LIGHTING THE EXECUTIVE MANSION AND PUBLIC GROUNDS: For gas, pay of lamplighters, gas fitters, and laborers; purchase, erection, and repair of lamps and lamp-posts; purchase of matches, and repairs of all kinds; stoves, fuel, and lights for office and office stable, watchmen's lodges, and for the greenhouses at the nursery, nineteen thousand five hundred dollars: *Provided*, That for each five-foot burner not connected with a meter in the lamps on the public grounds not more than eighteen dollars shall be paid per lamp for gas, including lighting, cleaning, and keeping the lamps in repair, under any expenditure provided for in this Act; and said lamps shall burn every night, on the average, from fifteen minutes after sunset to forty-five minutes before sunrise; and authority is hereby given to substitute other illuminating material for the same or less price, and to use so much of the sum hereby appropriated as may be necessary for that purpose: *Provided further*, That four thousand two hundred dollars of the foregoing sum shall be paid from the revenues of the District of Columbia and the remainder from the Treasury of the United States: *And provided further*, That not more than six thousand dollars of said appropriation may be expended for lighting, extinguishing, cleaning, repairing, and painting park lamps of a higher candlepower than those provided for above and not less than sixty candlepower, which lamps shall cost not to exceed twenty dollars and eighty-five cents per lamp per annum and shall otherwise be subject to the restrictions of this paragraph.

Provisos. Maximum per lamp.

Part from District revenues.

Higher candlepower.

Electric lights.

For lighting six arc electric lights in Executive Mansion grounds within the iron fence, at not exceeding eighty-five dollars per light per annum, which shall cover the entire cost to the United States of lighting and main-

taining in good order each electric light in said grounds, five hundred and ten dollars.

For lighting six arc electric lights at the propagating gardens, at not exceeding eighty-five dollars per light per annum, which sum shall cover the entire cost of lighting and maintaining in good order each of said arc electric lights, five hundred and ten dollars.

For lighting arc electric lights in public grounds as follows: For seven in grounds south of the Executive Mansion, thirty-two in Lafayette, Franklin, Judiciary, and Lincoln parks, fourteen in grounds south of Executive Mansion and in Monument Park, and twenty-seven in Potomac Park driveway, at not exceeding eighty-five dollars per light per annum, which sum shall cover the entire cost of lighting and maintaining in good order each of said arc electric lights; in all, six thousand eight hundred dollars, one half of which sum shall be paid from the revenues of the District of Columbia and the other half from the Treasury of the United States.

Half from District revenues.

TELEGRAPH TO CONNECT THE CAPITOL WITH THE DEPARTMENTS AND GOVERNMENT PRINTING OFFICE: For care and repair of existing lines, one thousand five hundred dollars.

Government telegraph.

WASHINGTON MONUMENT: For the care and maintenance of the Washington Monument, namely: For one custodian, at one hundred dollars per month; one steam engineer, at eighty dollars per month; one assistant steam engineer, at seventy dollars per month; one fireman, at fifty-five dollars per month; one assistant fireman, at fifty-five dollars per month; one conductor of elevator car, at seventy-five dollars per month; one attendant on floor, at sixty dollars per month; one attendant on top floor, at sixty dollars per month; three night and day watchmen, at sixty dollars per month each; in all, eight thousand eight hundred and twenty dollars.

Washington Monument.

For fuel, lights, oil, waste, packing, tools, matches, paints, brushes, brooms, lanterns, rope, nails, screws, lead, electric lights, heating apparatus, oil stoves for elevator car and upper and lower floors; repairs to engines, boilers, dynamos, elevator, and repairs of all kinds connected with the Monument and machinery; and purchase of all necessary articles for keeping the Monument, machinery, elevator, and electric plant in good order, three thousand dollars.

Expenses.

REPAIRS OF BUILDING WHERE ABRAHAM LINCOLN DIED: For painting and miscellaneous repairs, two hundred dollars.

Building where Abraham Lincoln died.

LINCOLN MEMORIAL SHAFT OR TABLET: To aid in the construction of the Abraham Lincoln memorial shaft or tablet, at Hodgenville, Kentucky, to be paid to the chairman of the commission appointed by the governor of the Commonwealth of Kentucky under an act of the general assembly of that State approved March sixteenth, nineteen hundred and six, the sum of ten thousand dollars.

Lincoln memorial shaft, etc.

Hodgenville, Ky.

Washington's birthplace, Va.

BIRTHPLACE OF WASHINGTON, VIRGINIA: For repairs to fences and cleaning up and maintaining grounds about the monument, five hundred dollars.

Engineer Department.

ENGINEER DEPARTMENT.

Rivers and harbors.

Toward the construction of works on harbors and rivers, under contract and otherwise, and within the limits authorized by law, namely:

Vol. 29, p. 202.

For works authorized by the river and harbor Act of eighteen hundred and ninety-six, as follows:

Kentucky River, Ky.

Improving Kentucky River, Kentucky: For continuing improvement in completion of contract authorization, seventy-five thousand dollars.

Portland, Me.

Improving harbor at Portland, Maine: For completing improvement, fifty-nine thousand dollars.

Newtown Creek, N. Y.

Improving Newtown Creek, New York: For continuing improvement, fifteen thousand dollars.

San Pedro, Cal.

Improving harbor at San Pedro, California: For continuing construction of breakwater, ninety-two thousand nine hundred and fifteen dollars.

Winyah Bay, S. C.

Improving Winyah Bay, South Carolina: For continuing improvement of harbor at Winyah Bay, seventy-two thousand seven hundred and fifty dollars.

Vol. 30, p. 1121.

For works authorized by the river and harbor Act of eighteen hundred and ninety-nine, as follows:

Gowanus Bay, N. Y.

Improving channel in Gowanus Bay, New York: For continuing improvement of Bay Ridge and Red Hook channels, two hundred thousand dollars.

Gulfport, Miss.

Improving harbor at Gulfport, Mississippi: For maintenance of channel from Gulfport to Ship Island Harbor, including anchorage basin, ten thousand dollars.

Ambrose channel, New York Harbor.

Improving harbor at New York, New York: For continuing improvement of Ambrose Channel (formerly known as East Channel) across Sandy Hook Bar, four hundred and seventy thousand dollars.

Ohio River below Pittsburg, Pa.

Improving Ohio River below Pittsburg, Pennsylvania: For continuing improvement in completion of contract authorization by the construction of Dams Numbered Thirteen and Eighteen, two hundred and seventy-eight thousand dollars.

Vol. 32, p. 331.

For works authorized by the river and harbor Act of nineteen hundred and two, as follows:

Boston, Mass.

Improving harbor at Boston, Massachusetts: For continuing improvement in completion of contract authorization by providing channels thirty-five feet deep, and of authorized widths, from the navy-yard at Charlestown and the Chelsea and Charles River bridges to President Roads, and thence by route designated as numbered three through Broad Sound to the ocean, nine hundred and thirty thousand dollars.

Arthur Kill, N. Y. and N. J.

Improving Arthur Kill, New York and New Jersey: For continuing improvement of channel from Kill van Kull to Raritan Bay, eighty-five thousand dollars.

Improving harbor at Cleveland, Ohio: For continuing improvement in accordance with the plan for new harbor entrance and breakwater extension, two hundred thousand dollars. Cleveland, Ohio.

Improving Kennebec River, Maine: For completing improvement between Gardiner and Augusta, twenty-six thousand dollars. Kennebec, River, Me.

Improving Great Pedee River, South Carolina: For continuing improvement of upper portion of river, thirty thousand dollars. Great Pedee River, S. C.

Improving Middle and West Neebish channels, Saint Marys River, Michigan: For continuing improvement, in completion of contract authorization, one million dollars. St. Marys River, Mich.

Improving Ohio River below Pittsburg, Pennsylvania: For continuing improvement by the construction of Lock and Dam Numbered Thirty-seven, two hundred and seventy thousand dollars. Ohio River below Pittsburg, Pa.

For works authorized by the river and harbor Act of nineteen hundred and five, as follows: Vol. 33, p. 1117.

Improving harbor at Burlington, Vermont: For continuing work of repairs to breakwater, thirty-five thousand dollars. Burlington, Vt.

Improving Black Rock Harbor and Channel, New York: For continuing improvement, three hundred and sixty-seven thousand dollars. Black Rock Harbor and channel, N. Y.

Improving Black Warrior, Warrior, and Tombigbee rivers, Alabama: For continuing improvement in completion of contract authorization by the construction of Locks and Dams Numbered One and Two in the Tombigbee River, and the completion of Lock and Dam Numbered One in the Tombigbee River near Demopolis, and those Numbered Two and Three in the Warrior River next above, and by the construction of dredge and lock houses as authorized, two hundred and thirty-eight thousand dollars. Black Warrior, Warrior, and Tombigbee rivers, Ala.

Improving Cape Fear River, North Carolina: For continuing improvement at and below Wilmington in completion of contract authorization, one hundred thousand dollars. Cape Fear River, N. C.

Improving Cumberland River above Nashville, Tennessee: For continuing improvement by the construction of Lock and Dam Numbered Twenty-one, thirty thousand dollars. Cumberland River above Nashville, Tenn.

Improving Calumet River, Illinois and Indiana: For continuing improvement in completion of contract authorization, twenty thousand dollars. Calumet River, Ill. and Ind.

Improving harbor at Duluth, Minnesota, and Superior, Wisconsin: For continuing improvement, two hundred thousand dollars. Duluth, Minn., and Superior, Wis.

Improving harbor at Huron, Ohio: For completing improvement, forty-seven thousand dollars. Huron, Ohio.

Improving harbor at Holland, Black Lake, Michigan: For continuing improvement of harbor at Holland in Holland, Black Lake, Mich.

completion of contract authorization, forty thousand dollars.

Mississippi River at Moline, Ill.

For continuing improvement of Mississippi River at Moline, Illinois, in completion of contract authorization, one hundred and thirty-six thousand dollars.

Between St. Paul and Minneapolis, Minn.

For continuing improvement of Mississippi River between Saint Paul and Minneapolis by the completion of Locks and Dams Numbered One and Two, thirty thousand dollars.

Oakland, Cal.

Improving harbor at Oakland, California: For continuing improvement, with a view to obtaining a channel three hundred feet wide and twenty-five feet deep from San Francisco Bay to Fallon street, twenty-three thousand dollars.

Providence River and Harbor, R. I.

Improving Providence River and Harbor, Rhode Island: For completing improvement, including Green Jacket Shoal, one hundred and two thousand seven hundred and seventy-eight dollars.

Patapsco River, Md.

Improving Patapsco River, Maryland: For continuing improvement in completion of contract authorization of channel to Baltimore, including shoals in Chesapeake Bay off York Spit, five hundred thousand dollars.

Savannah, Ga.

Improving harbor at Savannah, Georgia: For completing improvement, sixty thousand dollars.

Sandusky, Ohio.

Improving harbor at Sandusky, Ohio: For continuing improvement, one hundred and seventy-five thousand dollars.

St. Marys River, Mich.

Improving Saint Marys River, Michigan: For continuing improvement at the falls, in completion of contract authorization, two hundred and fifty thousand dollars.

Trinity River, Tex.

Improving Trinity River, Texas: For continuing improvement in completion of contract authorization, seventy-five thousand two hundred and eighty-seven dollars.

Tennessee River below Chattanooga, Tenn., Ala., Ky.

Improving Tennessee River below Chattanooga, Tennessee, Alabama, and Kentucky: For continuing improvement at Colbert and Bee Tree shoals by the construction of a lateral canal, in completion of contract authorization, one hundred thousand dollars.

Wilmington, Cal.

Improving harbor at Wilmington, California: For completing improvement, fifty thousand dollars.

Mississippi River. Bridge across, at Fort Snelling, Minn. Expenses. Vol. 34, p. 66.

BRIDGE ACROSS MISSISSIPPI RIVER AT FORT SNELLING, MINNESOTA: For payment of all expenses to be borne by the United States in connection with the construction of a bridge across the Mississippi River between the Fort Snelling Military Reservation and the city of Saint Paul, Minnesota, as authorized by law, one hundred and twenty-five thousand dollars.

* * * * *

MISCELLANEOUS OBJECTS, WAR DEPARTMENT.

Miscellaneous.

* * * * *

IMPROVEMENT OF THE YELLOWSTONE NATIONAL PARK: For maintenance and repair of improvements, including not exceeding ten thousand dollars which shall be used for the repair and improvement of the east and south roads in the Yellowstone Forest Reserve; also, not exceeding one thousand dollars which shall be used for the survey of a wagon road for light vehicles connecting the Mammoth Hot Springs in the Yellowstone National Park to a point on the western boundary of said park where the West Gallatin River crosses the boundary line of said park and connecting with the wagon road heretofore constructed by Gallatin County, Montana, along the West Gallatin River. The Secretary of War is directed to report from such survey to the next session of Congress estimates of what it would cost to construct such road and upon the advisability and feasibility of such construction, seventy-five thousand dollars, to be expended by and under the direction of the Secretary of War; and to be immediately available.

Yellowstone Park.

Roads in forest reserve.

Survey.

Report.

MOUNT RAINIER NATIONAL PARK: For continuing the construction of the wagon road into said park, from the west, heretofore surveyed and commenced, under the direction of the Secretary of War, to be immediately available, fifty thousand dollars.

Mount Rainier Park.

ENLARGEMENT OF GOVERNORS ISLAND, NEW YORK: For continuing plan of improvement for the enlargement of Governors Island, New York Harbor, by wharf work, dredging, bulkhead, and filling, one hundred thousand dollars.[a]

Governors Island, N. Y.

* * * * *

MAPS, WAR DEPARTMENT: For publication of engineer maps for use of the War Department, inclusive of war maps, five thousand dollars.

Maps.

SURVEY OF NORTHERN AND NORTHWESTERN LAKES: For survey of northern and northwestern lakes, including all necessary expenses for preparing, correcting, extending, printing, and issuing charts and bulletins, and of investigating lake levels, with a view to their regulation, to be immediately available, seventy-five thousand dollars.

Survey of Northern and Northwestern Lakes.

* * * * *

CALIFORNIA DÉBRIS COMMISSION: For defraying the expenses of the Commission in carrying on the work authorized by the Act of Congress approved March first, eighteen hundred and ninety-three, fifteen thousand dollars.

California Débris Commission.

Vol. 27, p. 507.

---

[a] All of this appropriation is for work assigned to the Engineer Department.

New York Harbor. Deposits.

HARBOR OF NEW YORK: For prevention of obstructive and injurious deposits within the harbor and adjacent waters of New York City:

Inspectors.

For pay of inspectors, deputy inspectors, office force, and expenses of office, ten thousand two hundred and sixty dollars;

Crews.

For pay of crews and maintenance of six steam tugs and one launch, seventy-five thousand dollars;

Tug "Nimrod."

For reconstructing hull and overhauling steam tug Nimrod, five thousand dollars;

In all, ninety thousand two hundred and sixty dollars.

International Waterways Commission.

INTERNATIONAL WATERWAYS COMMISSION: For continuing the work of investigation and report by the International Waterways Commission, authorized by section four of the river and harbor Act approved June thirteenth, nineteen hundred and two, twenty thousand dollars.

Vol. 32, p. 373.

* * * * *

Public buildings, D. C. Restrictions on expenses for electricity.

SEC. 9. No appropriation heretofore or hereafter made for the construction or equipment of any executive or municipal building in the District of Columbia shall be expended for the production of electricity for light or power, unless, in the judgment of the Secretary of the Treasury, such necessary electric current for light and power can not be obtained at a less cost.

Salaries, sums for, to be in full.

SEC. 10. All sums appropriated by this Act for salaries of officers and employees of the Government shall be in full for such salaries for the fiscal year nineteen hundred and eight, and all laws or parts of laws in conflict with the provisions of this Act be, and the same are hereby, repealed.

Approved, March 4, 1907, 11 a. m.

March 4, 1907. [S. 1032.] [Public, No. 257.]

CHAP. 2922.—An Act To aid in the completion of a monument at Monterey, California, to commemorate the taking possession of the Pacific coast by Commodore John D. Sloat, United States Navy.

Vol. 34, p. 1408.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sum of ten thousand dollars, or so much thereof as may be necessary, be, and the same is hereby, appropriated, out of any money in the Treasury not otherwise appropriated, to aid in the completion of a monument to commemorate the taking possession of the Pacific coast by the late Commodore John D. Sloat, United States Navy, and for the preparation of the site for said monument, selected under authority of the War Department on the military reservation at Monterey, California, which sum shall be expended under direction of the Secretary of War: *Provided*, That the money hereby appropriated shall be drawn from time to time

Monterey, Cal. Monument to John D. Sloat. Appropriation for completing.

Provisos. Restriction of expenditure.

only as may be required during the progress of the work and upon the requisition of the Secretary of War: *And provided further*, That no part of the money hereby appropriated shall be expended until the design for said monument shall be approved by the Secretary of War.

Design to be approved by Secretary of War.

Approved, March 4, 1907, 11 a. m.

CHAP. 2926.—An Act To erect a monument on the Tippecanoe battle ground in Tippecanoe County, Indiana.

March 4, 1907. [S. 8012.]

[Public, No. 261.]

Vol. 34, p. 1410.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sum of twelve thousand five hundred dollars, or so much thereof as may be necessary, is hereby appropriated out of any money in the Treasury not otherwise appropriated, to be expended with the sum hereinafter named, under the direction of the Secretary of War, in procuring and erecting a monument upon Tippecanoe battle ground in Tippecanoe County, Indiana, in honor of General William Henry Harrison and the soldiers who composed the American army in the battle of Tippecanoe on the seventh day of November, eighteen hundred and eleven: *Provided*, That this appropriation is made upon the condition that the State of Indiana shall provide a like sum, to be expended for said purpose under the direction of the Secretary of War, in connection with the sum herein appropriated; and no part of the sum herein appropriated shall be available until said sum to be provided by the State of Indiana shall have been placed at the disposal of the Secretary of War.

Tippecanoe battlefield, Ind.

Appropriation for monument.

Proviso.

State to provide like amount.

SEC. 2. That the Secretary of War shall appoint one person who, with the governor of the State of Indiana and the president of the Tippecanoe Battle Ground Memorial Association, a voluntary association in Tippecanoe County, Indiana, shall constitute a commission, whose duty it shall be to select a suitable design for said monument, with such emblems and inscriptions as will properly commemorate the valor and sacrifices of the American army at the battle of Tippecanoe, subject to the approval of the Secretary of War.

Appointment of Commission.

Selection of design.

SEC. 3. That it shall be the duty of said commission to select a site for said monument, which shall be on the battle ground, to superintend the erection thereof, and to make all necessary and proper arrangements for the unveiling and dedication of the same when it shall have been completed. Said commissioners shall serve without compensation, and the State of Indiana shall make due provision for the protection and preservation of said monument without expense to the Government of the United States.

Selection of site, etc.

Service without compensation.

Protection and preservation.

Approved, March 4, 1907, 11 a. m.

March 4, 1907. [S. 8292.]

[Public, No. 263.]

Vol. 34, p. 1411.

CHAP. 2928.—An Act Providing for the completion by the Secretary of War of a monument to the memory of the American soldiers who fell in the battle of New Orleans at Chalmette, Louisiana, and making the necessary appropriation therefor.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sum of twenty-five thousand dollars be, and the same is hereby, appropriated, or so much thereof as may be necessary, out of any money in the Treasury of the United States not otherwise appropriated, for the completion of a monument to the memory of the soldiers who fell in the battle of New Orleans in the war of eighteen hundred and twelve, said monument to be completed under the direction and approval of the Secretary of War: *Provided*, That the State of Louisiana shall cede and transfer its jurisdiction to the property on which said monument is to be completed in accordance with the provisions of act numbered forty-one of the legislature of that State, approved July nineteenth, nineteen hundred and two: *Provided further*, That when said monument is completed the responsibility of maintaining the same and keeping the grounds surrounding it shall remain with the United Daughters of Seventeen hundred and seventy-six and Eighteen hundred and twelve, free of any expense or responsibility on the part of the Government of the United States.

Chalmette, La. Monument at, to soldiers who fell at battle of New Orleans. Appropriation.

Provisos. State to furnish site.

Maintenance, etc.

Approved, March 4, 1907, 11 a. m.

March 4, 1907. [H. R. 13304.]

[Public, No. 267.]

Vol. 34, p. 1413.

CHAP. 2932.—An Act To provide a suitable memorial to the memory of Christopher Columbus.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be erected in the city of Washington, in the District of Columbia, a suitable memorial to the memory of Christopher Columbus.

District of Columbia. Memorial to Christopher Columbus.

SEC. 2. That for the purpose of carrying out the provisions of this Act a commission, consisting of the chairman of the Senate committee on the Library of the Fifty-ninth Congress, the chairman of the Committee on the Library of the House of Representatives of the Fifty-ninth Congress, the Secretary of State, the Secretary of War, and the Supreme Knight of the Order of the Knights of Columbus, shall be created, with full authority to select a site and a suitable design, and to contract for and superintend the construction of said memorial.

Commission created to select site, etc.

SEC. 3. That for the purpose of carrying out the provisions of this Act the sum of one hundred thousand dollars, or so much thereof as may be necessary, is hereby appropriated out of any money in the Treasury of the United States not otherwise appropriated.

Appropriation.

Approved, March 4, 1907, 11 a. m.

CHAP. 2936.—An Act To amend an Act entitled "An Act to authorize the Ox Bow Power Company of South Dakota to construct a dam across the Missouri River."

Mar. 4, 1907. [H. R. 25672.]

[Public, No. 271.]
Vol. 34, p. 1415.
Missouri River, Mont.
Time extended to Ox Bow Power Company to dam (at Ox Bow bend).

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section two of chapter eighteen hundred and twenty-one of the laws of eighteen hundred and ninety-four, approved April twenty-eighth, nineteen hundred and four, is hereby amended to read as follows:

"SEC. 2. That this Act shall be null and void unless the structures herein authorized shall be commenced within one year and completed within three years from the date of approval thereof."

Time of construction.
Vol. 33, p. 571, amended.

Approved, March 4, 1907, 11 a. m.

[No. 22.] Joint Resolution Relating to securing a channel of six feet depth over Foys Flats in the Trent River, North Carolina, about four miles above Newbern.

Mar. 4, 1907. [H. J. R. 253.]

[Pub. Res., No. 22.]
Vol. 34, p. 1424.
Trent River, N. C.
Channel over Foys flats.
Vol. 34, p. 1083.
Ante, p. 2522.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War is authorized to expend such portion of the appropriation made in the river and harbor Act of this session for the Neuse and Trent rivers, North Carolina, as may be necessary for securing a channel of six feet depth over Foys Flats in the Trent River, North Carolina, about four miles above Newbern.

Approved, March 4, 1907, 10 a. m.

[No. 23.] Joint Resolution Authorizing the selection of a site and the erection of a pedestal for the Stephenson Grand Army memorial, in Washington, District of Columbia.

March 4, 1907. [S. J. R. 29.]

[Pub. Res., No. 23.]
Vol. 34, p. 1424.
District of Columbia.
Stephenson Grand Army memorial.
Commission appointed to select site for.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the chairman of the Committee on the Library of the Senate, the chairman of the Committee on the Library of the House of Representatives, the Secretary of War, and the secretary and the treasurer of the Stephenson memorial committee of the Grand Army of the Republic are hereby created a commission and authorized to select a site upon the property belonging to the United States in the city of Washington, other than the Capitol and Library grounds, for the erection of the Stephenson Grand Army memorial, to be presented by the Grand Army of the Republic to the people of the United States.

Appropriation.

SEC. 2. That for the preparation of the site so selected and the erection of a pedestal upon which to place the said memorial, under the direction of the commission hereby created, the sum of ten thousand dollars, or so much thereof as may be necessary, is hereby appropriated

out of any money in the Treasury not otherwise appropriated.

Vol. 32, p. 740, repealed.

SEC. 3. That the joint resolution "granting permission for the erection of a monument or statue in Washington City, District of Columbia, in honor of the late Benjamin F. Stephenson, founder of the Grand Army of the Republic," approved May third, nineteen hundred and two, is hereby repealed.

Approved, March 4, 1907, 11 a. m.

years this method of temporary improvement of the low-water channel was adopted, and has been applied with success. The history of the work from the beginning, and of the experiences which led to the adoption of this method and the reasons therefor are fully detailed in former reports.

One of the important items in the operations of the Commission is the general repair and construction of levees, which was first authorized without qualifying restrictions by the act of September 19, 1890, and since that date about one-half of the appropriations made by Congress have been devoted to that purpose.

The project under which the work of the Commission has been conducted for several years past and which is proposed for the year to come may be stated in general terms as follows:

1. Continuation of surveys; preparation and publication of maps; maintenance of gauges; the recording, tabulation, and publication of gauge readings; the taking and recording of discharge measurements at high and low stages of the Mississippi River and its tributaries, and other observations.
2. The building, extension, and repair of levees.
3. The building, maintenance, and operation of dredge boats.
4. The repair and extension of existing works for the improvement of the channel, the preservation of harbors, the prevention of cut-offs, and the security of levees.
5. The maintenance of a low-water channel between the Mississippi, Red, and Atchafalaya rivers.

Other miscellaneous details incident to the execution of the general project, all of which are treated in the following pages.

APPROPRIATIONS AND ALLOTMENTS.

By the sundry civil act approved June 30, 1906, the sum of $2,000,000 was appropriated for continuing improvement of Mississippi River from Head of Passes to the mouth of the Ohio River, including salaries and clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission. The amount thus appropriated was allotted, on the recommendation of the Commission, as follows:

GENERAL.

Mississippi River Commission	$30,000	
Surveys, gauges, and observations	47,000	
Dredges and dredging	225,000	
		$302,000

FIRST AND SECOND DISTRICTS.

Upper St. Francis levee district	$70,000	
Lower St. Francis levee district	140,000	
White River levee district	50,000	
Reelfoot levee district	100,000	
Caruthersville, Mo	5,000	
Plum Point reach (repairs)	5,000	
Walnut Bend	25,000	
Old Town Bend	25,000	
Care and repair of plant	21,000	
New plant	14,000	
Surveys	5,000	
		460,000

THIRD DISTRICT.

Lower Yazoo levee district	$160,000	
Upper Tensas levee district	165,000	
Bolivar revetment	10,000	
Ashbrook Neck revetment	15,000	
Bank revetment at Fitlers Bend, for protection of levee and improvement of channel	97,500	
Bank revetment in Reid-Bedford Bend, for protection of levee and improvement of channel	150,000	
Greenville, Miss	15,000	
Stone	40,000	
Care and repair of plant	30,000	
New plant	45,000	
Surveys	5,000	
		$732,500

FOURTH DISTRICT.

Lower Tensas levee district	$235,000	
Atchafalaya levee district	25,000	
Ponchartrain levee district	35,000	
Lake Borgne levee district	10,000	
Barataria levee district	10,000	
Bondurant revetment	3,000	
Extension of bank revetment in Bondurant Chute, for protection of Lake Bruin levee	15,000	
Kempe Bend revetment	50,000	
Harbors of Natchez and Vidalia, Miss. and La	50,000	
New Orleans Harbor	10,000	
Care and repair of plant	25,000	
New plant	30,000	
Surveys	5,000	
		503,000
Reserve for allotment in the discretion of the President, Mississippi River Commission		2,500
Total		2,000,000

By the river and harbor act approved March 2, 1907, the sum of $3,000,000 was appropriated for improving the Mississippi River from the Head of the Passes to the mouth of the Ohio River, including salaries, clerical, official, traveling, and miscellaneous expenses of the Mississippi River Commission. The amount thus appropriated was allotted, on recommendation of the Commission, as follows:

GENERAL.

Mississippi River Commission	$20,500	
Surveys, gauges, and observations	58,500	
Dredges and dredging	179,000	
New inspection boat	66,000	
		$324,000

FIRST AND SECOND DISTRICTS.

Upper St. Francis levee district	160,000	
Lower St. Francis levee district	225,000	
White River levee district	180,000	
For bank revetment in Old Town Bend for protection of levee and the improvement of the channel	165,000	
Plum Point reach; repairs to existing works	25,000	
Hopefield Bend; repairs to existing works	37,000	
Walunt Bend	100,000	
For plant, First and Second districts	75,000	
Surveys	5,000	
		972,000

THIRD DISTRICT.

Lower Yazoo levee district	$225,000	
Upper Tensas levee district	225,000	
For bank revetment at Lake Bolivar, for protection of levee and the improvement of the channel	35,000	
For bank revetment at Lake Providence, for protection of levee and the improvement of the channel	25,000	
For bank revetment in Reid-Bedford Bend, for protection of levee and the improvement of the channel	40,000	
Stone	40,000	
General repairs to existing works	30,000	
For plant, Third district	135,000	
Surveys	10,000	
		$765,000

FOURTH DISTRICT.

Lower Tensas levee district	300,000	
Atchafalaya levee district	30,000	
Pontchartrain levee district	120,000	
Barataria levee district	25,000	
Lake Borgne levee district	25,000	
For bank revetment at Bondurant Chute, for protection of levee and the improvement of the channel	3,000	
For bank revetment in Kempe Bend, for protection of levee and the improvement of the channel	12,000	
Giles Bend	75,000	
Natchez front	100,000	
New Orleans Harbor	100,000	
For plant, Fourth district	65,000	
Surveys	5,000	
		860,000
Unallotted balance		79,000
Total		3,000,000

The following reallotments of funds for the fiscal year 1907 have been made during the year:

From dredges and dredging to surveys, gauges, and observations	$5,000
From dredges and dredging to Mississippi River Commission	15,000

The river and harbor act approved March 2, 1907, authorized the letting of contracts to the extent of $6,000,000, in addition to the amount appropriated by the act. This sum to be used in prosecuting the improvement for not less than three years, beginning July 1, 1908.

Nine thousand one hundred dollars was allotted by the Chief of Engineers from the permanent indefinite appropriation made by act of August 11, 1888, as amended by act of June 13, 1902, for gauging the waters of the Mississippi River and its tributaries, which is applied to the maintenance of certain river gauges.

Details of the expenditures of the various allotments are appended hereto.

MISSISSIPPI RIVER COMMISSION.

The commissioners during the past fiscal year were: Col. Clinton B. Sears, Corps of Engineers, U. S. Army, president; Maj. Thos. L. Casey, Corps of Engineers, U. S. Army, until August 14; Col. Jas. L. Lusk, Corps of Engineers, U. S. Army, until August 8; Lieut. Col. Wm. T. Rossell, Corps of Engineers, U. S. Army, since August 8; Maj. Jas. G. Warren, Corps of Engineers, U. S. Army, since August 14; Homer P. Ritter, assistant, U. S. Coast and Geodetic Survey; Robert S. Taylor; J. A. Ockerson, and Henry B. Richardson.

Capt. G. R. Lukesh, Corps of Engineers, U. S. Army, relieved Capt. Wm. B. Ladue, Corps of Engineers, U. S. Army, of his duties as secretary of the Commission on July 18, 1906. No other changes occurred during the year in the personnel of the officers in charge of works under the Commission.

Four meetings of the Commission were held during the year, as follows: The ninety-ninth at the offices of the Commission in St. Louis on August 27–28, 1906; the one hundredth, on board the steamer *Mississippi* during the low-water inspection of the river, November 17 to 24, 1906; the one hundred and first, on board the steamer *Mississippi* during the high-water inspection of the river, March 17 to 23, 1907, and the one hundred and second, at the offices of the Commission in St. Louis, June 24 to 26, 1907.

At all of these meetings public hearings were given to the representatives of the navigation and commercial interests of the river.

SURVEYS AND MAPS.

Surveys.—The field work of the general survey of the Mississippi River from Head of the Passes to the headwaters was completed in July, 1904, and the reduction and platting of the field notes of the last two field seasons are now in progress. The extent and character of the general survey is given in the annual report of the Commission for 1905.

The field work of the low-water survey from Cairo to the mouth of the Arkansas River was completed in November, 1904, and the reduction and platting of the field notes were completed in the office last year. The results of this survey will be compared with those of the earlier general survey of this stretch, with a view to determining the changes that have taken place.

When the Mississippi River Commission in 1900 reran the line of precise levels between Baton Rouge, La., and Fort Adams, Miss., a discrepancy of about 1 foot was found to exist at the latter point between the earlier and later levels. This releveling was extended northward to Vicksburg, Miss., in 1905–6, and during the past season was carried from Vicksburg to mouth of White River. It is proposed to continue this work northward next season.

Many of the permanent marks of the general survey of the river having been destroyed in the twenty years that have passed since they were set, a party was put in the field in the fall of 1905 to restore the system. The work was begun at Cairo and completed to Barfield, Ark., a distance of about 142 miles, where the work was suspended for that season. The work was resumed in October, 1906, and completed to about 5 miles above Helena, Ark., a distance of about 160 miles on January 11, 1907, when work was suspended on account of high water. It is proposed to continue this work next season.

Maps.—No new maps or charts were published during the year, but a new edition of the inch-to-mile maps below Cairo, Nos. 1 to 12, 14, 18, and 20 have been printed, and Nos. 13, 15, 16, 17, 19, and 21 of the same series are in the hands of the printer.

The inch-to-mile series, Nos. 142–144, extending from the lower limits of Brainerd, Minn., 1,035 miles above Cairo, to within 46 miles

of Grand Rapids, Minn., and detail charts No. 234 to No. 256, scale 1 to 10,000, extending from about 4½ miles above Aitkin, Minn., 1,090 miles above Cairo, to Lake Winnibigoshish, Minn., have been prepared in part for the publisher.

Gauges.—The regular gauges, high-water gauges, and tide gauges have been maintained during the year, periodic inspections being made for the purpose of making needed repairs to gauges and bulletins and determining errors in the gauges, if any. During the high water of January and February, 1907, and again during the high water of March and April, reports were received from the high-water gauge observers, and profiles of both rises have been prepared from Cairo to the Head of the Passes.

Discharge observations.—During the high water of January and February, 1907, discharges were measured at Columbus, Ky., Helena, Ark., Chicot, Ark., Vicksburg, Miss., Red River Landing, La., and Carrollton, La., on the main river, and at Clarendon on the White, Simmesport on the Atchafalaya, Jonesville, La., on the Black, and in Lower Old River between the Mississippi and the Atchafalaya. All of these discharges were measured at the highest stages reached at the respective stations, except at Columbus, Ky., where a second series was obtained in March and April.

For further details concerning the foregoing attention is invited to the report of Capt. G. R. Lukesh, Corps of Engineers, U. S. Army, secretary, appended hereto.

DREDGES AND DREDGING.

Project.—A statement of the project under which the hydraulic dredges of the Commission have been built, maintained, and operated will be found on page 8 of the Annual Report for 1904. The success attained in dredging and the importance of the unfailing maintenance of the channel is discussed in the report of 1905, pages 9 and 10, and the recommendation therein made for ample funds to carry on this work continuously as required is again renewed.

The new dredge now nearing completion at Grafton, Ill., it is expected, will be available for dredging service below Cairo during the coming season.

Season's operations.—During the low-water season of 1906 five dredges, the *Delta*, *Epsilon*, *Iota*, *Kappa*, and *Henry Flad* were operated on various bars from Point Pleasant, Mo., 83 miles below Cairo, to Presidents Island, 235 miles below Cairo, doing such work as was required to keep the channel open; the usual surveys were made of all crossings where shoal water was expected. No work was required below Presidents Island. The river began to rise rapidly about the middle of November and remained at a moderately high stage thereafter, so that no further dredging was required during the season; all of these dredges were returned to the fleet at West Memphis and put out of commission by December 21. Depths of 10 feet and over were found on all crossings throughout the year.

For further details concerning the dredges and dredging, attention is invited to the report of Capt. G. R. Lukesh, Corps of Engineers, U. S. Army, secretary, appended hereto.

CHANNEL WORK, BANK PROTECTION, AND HARBOR IMPROVEMENTS IN THE SEVERAL DISTRICTS.

First district, from Cape Girardeau, Mo., to the foot of Island 40 (270 miles).—Headquarters: Custom-house, Memphis, Tenn. District officer, Capt. Wm. D. Connor, Corps of Engineers.

Construction works for channel improvement, protection of caving banks, and harbor work in this district are located at Columbus and Hickman, Ky., New Madrid and Caruthersville, Mo., and Plum Point reach, together with certain isolated works, consisting of low-water channel dikes at different points throughout this district.

Columbus, Ky., 21 miles below Cairo, left bank.—The work at this point was done in 1889 and 1890, and consists of five submerged dikes, protecting about 2,200 feet of harbor front. No repairs have been made since and no work other than possible minor repairs is projected for the coming season.

Hickman, Ky., 36 miles below Cairo, left bank.—The work at this point consists of 1,450 feet of effective continuous revetment placed in 1889, 1892, and 1894 to prevent caving along the lower portion of the town. Slight repairs were made in 1900 on account of injury to the revetment from local drainage. The work is now in good condition, and nothing additional is at present contemplated.

New Madrid, Mo., 71 miles below Cairo, right bank.—This work consists of bank revetment extending along the river front of the town, of continuous fascine mattresses 260 feet wide below low water, with riprap paving on the graded bank above low water. Nine hundred feet of revetment were constructed in 1893, and afterwards extended as follows: Seven hundred feet in 1894, 500 in 1896, 1,573 in 1898, and 1,000 in 1900. The present effective revetment is 4,450 feet long and is in good condition. For the present no additional work will be required at this point.

Caruthersville, Mo., 110 miles below Cairo, right bank.—This work consists of one spur dike and a continuous revetment for the protection of the caving bank in front of the town. During the past year a pocket mat about 150 by 150 feet was constructed at the lower end of the existing revetment where the revetment had been flanked by an eddy. A few slight repairs were made to the paving along this revetment wherever it was needed, and there is now about 2,400 feet of effective revetment at this point.

Plum Point reach, 147 to 186 miles below Cairo.—The works in this reach comprise about 67,400 feet of revetment for the protection of caving banks, the partial closure of the chutes behind Elmot bar and Island 30 with a brush and stone dam, the closure of Osceola and Bullerton chutes with pile dikes, and a levee along the left bank to confine the flood waters more nearly to the low-water channel. The object of all these works was to increase the navigable depth at low water in a reach of river which had been noted for years for its obstructing sand bars. As a result the banks have remained practically fixed within the prescribed limits, and the navigable depth at low water has been increased to such an extent that little or no difficulty has been experienced in navigating this reach since the works approached completion.

At no time since the works were well under way has the navigable depth reached as low a point as it did nearly every low-water season prior to the construction of the rectification works.

The only work required in this reach during the past season was to complete the bank paving above mats Nos. 9 and 10 in Fletchers Bend constructed in the season of 1905, and a few slight repairs to the pavement at Bullerton bar.

Abatis dikes.—These dikes are used for the purpose of closing secondary chutes and for contracting the low-water channel by building up sand bars. No work of this kind was done in the first district during the past season, but the bars at Cherokee Crossing and at Ashport bar that were built up by use of these dikes still remain in position.

For further details concerning the work in the first district see report of Captain Connor, appended hereto.

Second district, foot of Island 40 to White River (173 miles).—Headquarters: Custom-house, Memphis, Tenn. District officer, Capt. Wm. D. Connor, Corps of Engineers.

This district includes the protection of caving banks and harbor work at Hopefield Bend, Ark., Memphis, Tenn., and at Helena, Walnut Bend, and Old Town, Ark., and also the dredging of Wolf River, Tenn.

Hopefield Bend, Ark., 227 miles below Cairo, right bank.—This revetment, originally 16,600 feet long, was constructed at various times betwen 1882 and 1889, and has been repaired at various times. At the beginning of 1906 this revetment had been replaced by 14,800 feet of standard revetment, and the paving had been carried to the top of the bank over practically all of this length. During the past year two small breaks in the revetment were repaired and the bank was graded and paved at all points where the pavement had been destroyed. During the past high water some very considerable breaks have occurred in this revetment, but the extent of the damage can not be ascertained until the river falls.

Wolf River, 230 miles below Cairo, left bank.—The part of this stream under improvement is a part of Memphis Harbor, and the improvement consists of dredging, for the purpose of maintaining a 5-foot navigable channel during the low-water season from its mouth 2½ miles upstream to the county bridge. Until November, 1906, there had been little traffic above the Illinois Central Railway Bridge, known as Henning's bridge. This bridge was carried away by the high water in November, 1906. An effort is being made to have this bridge replaced by a drawbridge. This stream is navigable for some little distance above Henning's bridge, and there are good manufacturing sites that will probably be taken advantage of if there is open navigation along the upper part of this river. Owing to the very short low-water season very little work was required in Wolf River. All the work done was on the bar at the mouth of the river, and the mouth of the river was kept open throughout the season. Seven thousand four hundred and twenty cubic yards were dredged in keeping this bar open.

Memphis Harbor, 230 to 232 miles below Cairo, left bank.—The work along the Memphis front embraces the protection of 14,800 linear feet of bank by means of spur dikes and continuous revetment, the upper portion of which is covered by a sand bar which encroaches

somewhat upon the levee front of the city. The area of this bar between Wolf River and the levee front is about 100 acres at low water, of which 12 acres is above water at the 25-foot stage. The cross sections over the lower end of the bar show no marked change in its location or size. The revetment along the Memphis front is in good condition. No repairs were made during the past season, and none are contemplated for the coming season. Its present effective length is 9,900 feet.

Walnut Bend, Ark., 281 miles below Cairo, right bank.—During the past few years the bank along this bend has been caving with great rapidity and threatens to cut into the St. Francis River at this point. There are two objections to allowing this cut-off to take place. The first objection is that such a cut-off would raise the low-water level of the St. Francis River at this point from 8 to 10 feet, thus inundating a great deal of land that is normally under cultivation when the Mississippi River is within its banks. The second objection is that such a cut-off would preclude the possibility of extending the Lower St. Francis levee downstream across Hardins Point. This extension is a part of the contemplated project of the Lower St. Francis Levee Board, and would lower the backwater effect over a very considerable territory behind what is now the lower end of the Lower St. Francis levee system (mile 283 R.). A survey of the St. Francis River showed that a levee system along the left bank of this river, to protect against the backwater from the Mississippi, would cost considerably more than half a million dollars, and since the bank could be protected for less than one-half of this sum by means of standard revetment this idea of this back levee was abandoned. The efficiency of abatis dikes as bar builders suggested their use at this point to build a bar down into the caving bend and thus stop the caving. (For details of abatis dike construction, see Report of Chief of Engineers, 1899, p. 3536, Pl. 13.) A project was submitted providing for two dikes of a total length of 4,000 feet, to be built in the season of 1906 at a cost of $25,000, and two more dikes to be built in the season of 1907, provided that the results obtained from the first two dikes warranted a continuation of this part of the project. In case the two dikes built in 1906 did not build the bar as rapidly as expected there still remained time in the season of 1907 to revet this caving bend. The part of the project for 1906 was carried out and two dikes were built 970 feet apart. The upper dike was 1,454 feet long and the lower dike 1,755 feet long. A very considerable bar has been built up in the neighborhood of these dikes, but the downstream effect of them has not yet been ascertained. The conditions at this point were very favorable for this project, but the continued high water has not permitted a satisfactory survey to be made to determine the results obtained from the first two dikes.

Helena, Ark., 306 miles below Cairo, right bank.—The revetment work at this place consists of the protection of 4,900 linear feet of river bank in front of the city, of which 3,500 feet is continuous revetment and 1,400 feet of dike work. The caving or sloughing at very low stages continued during the past season to a lesser extent than heretofore, and the most noticeable changes occurred below the low-water line, but the levee is still dangerously threatened. To guard against this levee caving away a cross levee has been built below the threatened part, connecting the main White River levee

with the high ground to the west, and a similar line above the threatened part will be constructed by the local board for the protection of the city of Helena.

Old Town Bend, Ark., 324 miles below Cairo, right bank.—The bank in this bend has been caving slowly for a long time and had finally cut in so close to the levee that either the bank must be protected or a loop must be built in the levee along the caving bend. A survey was made to show the cost of such a loop and, owing to a lake immediately in the rear of the present levee, the cost of this loop was estimated at $370,000. The bank could be held by standard revetment for less than half of this amount and, since this bank protection would not only obviate the necessity for the costly loop but would serve as an improvement to the channel, it was decided to protect the bank. For similar reasons to those set forth in regard to Walnut Bend it was decided to construct two abatis dikes in the upper part of the bend in the season of 1906, with the hope that they would build a bar down into the bend and protect it from further caving. The conditions at this point were very unfavorable for the use of the abatis dikes, but it was considered justifiable to try them, since the estimate for the abatis dikes was only $18,000 and the estimate for reveting this bend with the standard revetment was about $170,000, and even in case the abatis dikes did not give the desired results they would still protect the upper end of any revetment that would be put in later. Two abatis dikes were constructed in the upper part of the bend 1,370 feet apart. The upper dike was 900 feet long and the lower one 1,260 feet long, and the total cost was $13,383.19. A survey in March of 1907 showed that although a bar had been built around these dikes, that the effect in the bend below was not sufficient to warrant building further dikes in the season of 1907, and the project for the revetment of this bend was submitted and approved.

For further details concerning the work in the second district, see report of Captain Connor, appended hereto.

Third district, from White River to Warrenton, Miss. (214 miles.)—Headquarters: Vicksburg, Miss. District officer, Capt. G. M. Hoffman, Corps of Engineers.

This district includes the works of improvement at Lake Bolivar front, Ashbrook Neck, Greenville Harbor, Longwood, and Fitlers Bend, Mississippi, and Louisiana Bend, Lake Providence revetment, Delta Point, and Reid-Bedford Bend, Louisiana. The operations of the past year included repairs to the revetments at Lake Bolivar, Ashbrook Neck, Greenville, and Lake Providence, and new revetment at Reid-Bedford Bend.

Lake Bolivar front, 417 miles below Cairo, left bank.—The revetment at this point was built to hold a bank, the caving of which threatened a levee extending across between the head of Lake Bolivar and the bank of the river, the destruction of which would have resulted in the abandonment of a large area of highly cultivated land and the construction of a very expensive back levee. The original work, constructed in 1888 and 1889, consisted of 4,200 linear feet of bank revetment. Slight repairs have been made at different times to the upper bank pavement, and in 1905–6, 2,134 feet of reenforcing mattress was placed. During the past season repairs to two sections of bank paving were made and a pocket mat placed. About 400

feet of the lower end and 1,000 feet of the upper end of the revetment has lately failed, and extensive renewals will be needed next season. This work now has an effective length of about 2,580 feet. Conditions here will be critical until the additional work, already provided for, is completed.

Ashbrook Neck, 446 miles below Cairo, left bank.—The object of the work at this point was to prevent a threatened cut-off, which would have disturbed the regimen of the river for a long distance above and below and brought disaster to towns, levees, and other works along the river banks. Work was begun in 1890 and continued at intervals until 1895. Repairs have been made from time to time in the upper bank paving, and with reenforcing mats where the original revetment has shown signs of weakness. During the past season one extensive pocket was repaired, a channel mat 500 feet long being placed outside the large pocket mat; one small pocket was repaired, and the old woven mat reenforced for a length of 1,200 feet by a fascine mat.

The present condition of the revetment is excellent.

Greenville Harbor, 478 miles below Cairo, left bank.—This work has for its object the rectification of the bank, to prevent the encroachment of the river on the town of Greenville, and also to prevent the destruction of the controlling levee line which protects the Yazoo basin from overflow. During the twelve years from 1882 to 1894 the recession of the bank in the Greenville bend amounted to 4,000 feet. This work was begun in 1887, when 10 submerged dikes were placed. The plan was changed to continuous revetment in 1891, and 14,500 feet of revetment have been placed, of which 12,100 feet is at present in effective condition. Since the completion of this work the bank line has been effectually maintained. The work of the past season consisted of the repair of a large break at the head of the revetment, both pocket and channel mats being necessary therefor; and, in addition, a number of minor repairs were made.

This revetment is in excellent condition, and only a few slight repairs may be needed next season.

Longwood, Miss., 500 miles below Cairo, left bank.—The object of this work was to hold the rapidly caving bank which threatened the large and costly levee at this point, the destruction of which would have necessitated the expenditure of more than $700,000 in the construction of a new line, besides throwing valuable land outside the levee system. The work was begun in the fall of 1904, and completed to an effective length of 4,200 feet during the season. The typical form of fascine mattress with upper bank paving was used. This work being undertaken solely for levee protection, part of its cost was met by the reallotment of $50,000 previously allotted to the levees of the district. The State levee board contributed $11,009.45 for use in the work. No construction work was done the past two seasons, and none is contemplated this season.

Though the extension of the revetment for about 1,000 feet downstream was provided for in 1905, it has not been necessary, and indications are that it can be postponed perhaps indefinitely.

Lake Providence reach, 517 to 552 miles below Cairo.—Prior to the improvement work this reach presented the most serious obstructions to low-water navigation of any portion of the river below Cairo, except, perhaps, the Plum Point reach. The depths were often as

low as 4½ to 5 feet on the crossings, and the location of the channel very uncertain. It was therefore selected by the Commission as one of the reaches where a project for systematic improvement should be carried out. The works in this reach resulted in a marked improvement in the channel depths, but they proved to be too light to long withstand the attacks of the floods. Revetment was for a time prohibited by Congressional enactment, appropriations failed, and the repairs and renewals deemed necessary to strengthen and hold the work already done could not be made; in consequence the uncompleted works were badly wrecked. It may, however, be said that these works served a useful purpose by materially improving the navigation of the entire reach, which still continues better than it was before the work was begun. There has been but one low-water season since the works approached a stage of completion when the channel depth was not sufficient for the demands of navigation, and even during that season the depth was some two feet greater than the common low-water depths prior to the beginning of the improvement work. For the past five years a depth of 12 feet or more has obtained.

Louisiana Bend, 522 miles below Cairo, right bank.—The revetment in this bend is part of the systematic improvement of Lake Providence reach. Work began in 1889 and was continued from time to time as funds were available until 1897. No extension or repair of this work has been made since then. The total length of the original work was 15,820 feet, of which about 4,000 feet at the lower end has been destroyed. About half the remaining work is protected by a large bar.

Lake Providence, 540 miles below Cairo, right bank.—The object of this revetment work was to control and hold the rapidly caving bank that threatened to destroy the town of Lake Providence and an important levee, situated between the lake and the bank of the river, the destruction of which would have necessitated the building of a long line of new levee, extending from Bunchs Bend around the lower end of Lake Providence, and would have resulted in the abandonment of several square miles of cultivated land, including a portion of the town of Lake Providence. Work was begun in 1894, and continued during the following year; further extensions were made in 1899 and 1900. The total length is now 12,600 feet, practically all of which is effective. Minor breaks have developed from time to time, and the revetment has been extensively reenforced with modern fascine mattresses, until only 2,200 feet of the original woven mat work remains unprotected.

A large break was repaired last season, both pocket and channel mats being used. In addition, a reenforcing mat was commenced, but it had reached a length of only 216 feet when it had to be sunk on account of an approaching flood.

Fitlers Bend, 552 miles below Cairo, left bank.—Allotment of $97,500 was made in August, 1906, for revetment in this bend to protect the levee from destruction by caving of the bank, study having shown that, unless this was done, a new levee would soon have to be built at such great cost as to be almost impracticable of accomplishment. On account of lack of plant, no work was done last season beyond the purchase of necessary materials.

It is contemplated to build about 3,000 feet of standard revetment next season.

Delta Point, 598 miles below Cairo, right bank.—The object of this work has been to hold the point opposite Vicksburg and to prevent recession of the channel downstream away from the harbor, and so aid in the improvement of the Vicksburg harbor, now in charge of the engineer department. Caving above the work has continued slowly and may eventually require an upstream extension of the revetment. No work has been done since 1899, and none is contemplated for the coming season.

The work has an effective length of 5,900 feet.

Reid-Bedford Bend, 605 miles below Cairo, right bank.—Allotment of $150,000 was made in August, 1906, for revetment in this bend, to protect a long line of large levee from destruction by caving of the bank. A new line of levee to cover the threatened portion would have been exceedingly difficult to build; would probably have required three seasons for its execution, and would have been so costly as to be almost prohibitive. By using a revetment outfit and force borrowed from the First and Second districts, mats were placed during the past season covering 2,200 feet of bank, but no upper bank paving was possible on account of high water. It is contemplated to continue this work next season.

Further details of the work in this district may be found in the report of Captain Hoffman, hereto appended.

Fourth district, Warrenton, Miss., to Head of Passes, 607–1,060 miles below Cairo.—Headquarters, 1539 Louisiana avenue, New Orleans, La. District officer, Capt. J. F. McIndoe, Corps of Engineers, U. S. Army.

The work includes bank protection in Bondurant Chute, bank protection in Kempe Bend, improvement of harbors at Natchez and Vidalia, rectification of Red and Atchafalaya rivers, and improvement of the harbor at New Orleans, La.

Bondurant Chute, 644 miles below Cairo, right bank.—This work was undertaken in 1899 in order to prevent the destruction of the levee lying between the upper end of Lake Bruin and the bank of the river, no other location of the levee line being practicable in the immediate vicinity, and its abandonment involving the construction of a loop several miles long around and behind the lake. In addition to the cost of constructing this new line of levee to replace the old one, the abandonment of the latter would result in the exposure to overflow of a large amount of cultivated land.

The revetment consists of mattresses, constructed of lumber and willow brush, and a few experimental ones built entirely of lumber, for the submerged portion, with an upper bank pavement of concrete and rock. The revetment has now a total length of 3,440 linear feet, and is in good condition.

During the past season repairs were made to the upper bank pavement, the revetment was extended 1,000 feet at the lower end, and the upper bank along this stretch graded and partially paved for a length of 1,100 feet. The extension was required to cover caving of the unprotected bank immediately below the revetted portion. The work has been successful in protecting the levee.

Kempe Bend, 658 miles below Cairo, right bank.—The object of this work has been to prevent further erosion of the bank line in

Kempe Bend, which has already destroyed several lines of levee and nearly reached a final line, the destruction of which would necessitate a long line of new levee of extremely difficult and costly construction. The construction of a new line would also require a long period of time, and a break in the front line in the meantime would be disastrous to a large section of the country below Kempe. Work on the revetment was begun in 1899 and continued each season since that time, until at the date of the last annual report of the Commission, it had reached a length of 10,641 linear feet.

During the past season the revetment was extended 230 feet at the upper end, 850 linear feet of mattress was placed to repair a cave at the lower end, and 2,650 linear feet of connecting mattress was placed along the inshore edge of the channel mats, extending the work up to about a 10-foot stage on the Vicksburg gauge. The upper bank was graded for a length of 1,009 feet. Further operations during the year were prevented by the unusually early high water.

The work has been successful thus far in protecting the levee, though numerous small failures of portions of the revetment have occurred, permitting the upper bank line to recede slightly. The present condition of the work is good.

Harbors at Natchez and Vidalia, Miss. and La., 688 miles below Cairo.—The object of this work is to prevent a threatened cut-off which would destroy the harbors of Natchez and Vidalia and disturb the general regimen of the river for many miles above and below. The general project for this work, adopted in 1891, contemplated the construction of a levee on or near the axis of Cowpen Neck, to prevent a flow of water across the neck during high stages of the river, and the construction of about 16,000 linear feet of revetment in Giles Bend.

Work on the levee was begun in 1894 and contemplated in 1895, the levee being 19,500 feet long. The levee was raised and enlarged in 1898.

Work on the revetment was begun in 1897 and continued each season since that time, until, at the date of the last annual report of the Commission, it had reached a length of 18,108 linear feet in two detached pieces of 8,192 and 9,916 feet, respectively.

During the past season the lower revetment has been extended upstream 1,100 linear feet, making the total length of subaqueous work 19,208 feet, in two detached pieces of 8,192 and 11,016 feet, respectively. The unprotected interval between the pieces is about 3,700 feet. Repairs were made to existing revetment at Spurs 14 and 15 by placing 1,050 linear feet of new mattress, and extensive repairs were made to the upper bank pavement along the lower revetment and at Spurs 3, 9, 14, and 15.

The work in place has been successful, but the gap between the two detached pieces of revetment must be closed. The levee along the axis of Cowpen Neck is in good condition.

Junction of the Mississippi, Red, and Atchafalaya rivers, Louisiana, 764 miles below Cairo.—The improvement in this locality consists in the maintenance of mattress sill dams in the Atchafalaya River for the purpose of preventing enlargement of that stream, and dredging the low-water channel of Old River for the purpose of

maintaining an adequate depth between the Mississippi, Red, and Atchafalaya rivers.

The original sills were placed in 1887–89, and since that time no enlargement of the Atchafalaya for several miles above and below has been observed. The dams are apparently in good condition, and beyond slight repairs to maintain them no further work is contemplated in this section.

During the past season no dredging was required in Lower Old River in order to maintain a suitable channel for navigation. This result is largely attributable to the absence of extreme low water and to the fact that the current through Old River was almost constant during the year from the Mississippi toward the Atchafalaya. A lack of these conditions in the future will probably necessitate annual dredging to maintain an adequate channel through Old River during low water. The physical changes in the vicinity are carefully measured by means of frequent surveys, the latest of which shows but slight change from the conditions of previous years.

New Orleans Harbor, 965 miles below Cairo, right and left banks.—The object of the work in this harbor is to prevent the erosion of banks and consequent loss and damage to adjacent property. The work consists mainly of spur dikes placed at intervals of about 450 feet and of continuous revetment of the lower bank. In places where erosion was specially active continuous revetment was placed between the spurs.

Work under the present project was begun in 1883, and has continued each season as funds were available, until at the date of the last annual report of the Commission the banks were protected as follows: In Carrollton Bend for 7,360 feet by continuous mattress, and for 1,970 feet by 5 spur dikes in conjunction with continuous mattress; in Greenville Bend, opposite Audubon Park, for 1,940 feet by 2 spur dikes; in the Gouldsboro-Algiers Bend for 9,475 feet by 19 spur dikes, and in the Third District Reach for 6,535 feet by 14 spur dikes, and for 1,240 feet by 2 spur dikes and a continuous mattress. A total length of about 5½ miles of bank is thus protected by dikes and continuous revetment.

During the past season 4 additional spur dikes were placed in the intervals between previously existing spurs Nos. 2 and 3, 3 and 4, 4 and 4½, and 5 and 6 of the Gouldsboro series. In addition 3 small buttresses were placed immediately below spurs 2, 4, and 6, and the shore ends of spurs 1, 2, 3, 4, 5, and 6 were repaired. In the Carrollton Bend 570 linear feet of continuous subaqueous revetment was laid along the 60-foot contour in prolongation of the work downstream.

The steep banks and great depths of water make the preservation of the banks of the New Orleans Harbor both difficult and expensive, and the danger of sudden collapse in certain localities is by no means remote. Under the conditions here found it is of more than ordinary importance that ample means should be provided for the extension and completion of the revetment necessary to make the river banks along the city front reasonably safe.

For further details concerning the work in this district, see the report of Capt. James F. McIndoe, Corps of Engineers, hereto appended.

PLANT IN THE SEVERAL DISTRICTS.

First and second districts.—This plant is located a short distance below Memphis when not in active service. During the year repair work was actively carried on and the plant was put in effective condition. The new plant added consists of a quarter boat for survey party and one small barge.

For further details relative to plant in the first and second districts reference is made to the reports of Capt. Wm. D. Connor.

Third district.—The plant pertaining to the third district is cared for at Vicksburg, Miss., when not in use. Extensive repairs were made during the season and the plant has been maintained in good condition.

Stone for revetment work is supplied from a quarry owned by the Government. It is located at Searcy, Ark., and is operated when towing stages exist in the Little Red and White rivers.

For further details respecting plant in the third district reference is made to the report of Capt. Geo. M. Hoffman.

Fourth district.—The plant pertaining to the fourth district is cared for at New Orleans, La. General repairs to the entire plant have been made, and it is now, with the exception of such portions as are worn out, in good condition. During the year one standard creosoted barge was built under contract, and the construction of five additional barges has been commenced by hired labor.

For further details of the plant in the fourth district reference is made to the report of Capt. James F. McIndoe.

Other plant.—The steamer *Mississippi*, used for the inspection trips of the Commission, the steamers and quarter boat used in the general surveys, and the dredges, with the steamers, towboats, pile sinkers, and barges used in connection with the dredging operations, are cared for at West Memphis, Ark., where a general supply and repair depot has been established. Necessary repairs have been made during the year and the plant maintained in good condition. The tenth hydraulic dredge, the *B. M. Harrod*, was placed under contract April 21, 1905, and the work of construction is now practically completed.

For details of this plant reference is made to the report of Capt. G. R. Lukesh, secretary of the Commission.

SURVEYS IN THE ENGINEER DISTRICTS.

In order to keep in close touch with the condition of the improvement works, the caving banks, and changes affecting the regimen of the river, annual surveys are made covering such portions of the river as may be required. The discussion of the results obtained will be found in the reports of the district officers herewith.

LEVEES.

For convenience in administration and the allotment of funds for levee purposes, the river front has been divided by the Commission into levee districts. The names and locations of these districts, as now authorized by the Commission, are as follows:

1. The district on the right bank from the vicinity of Cape Girardeau, Mo., to New Madrid, Mo., to be called the Upper St. Francis levee district.

2. The district on the left bank from Hickman, Ky., to Slough Landing, Tenn., to be called Reelfoot levee district.

3. The district on the right bank extending from the vicinity of New Madrid, Mo., to the mouth of the St. Francis, to be called Lower St. Francis levee district.

4. The district on the left bank extending from just below Memphis to the Bolivar-Coahoma County line, to be called Upper Yazoo levee district.

5. The district on the left bank extending from the Bolivar-Coahoma County line to mouth of the Yazoo, to be called Lower Yazoo levee district.

6. The district on the right bank extending from Helena to White River, to be called White River levee district.

7. The district on the left bank from the mouth of the Yazoo River to Baton Rouge to be called the Homochitto levee district.

8. The district on the right bank extending from Arkansas River to opposite Warrenton, Miss., to be called Upper Tensas levee district.

9. The district on the right bank extending from opposite Warrenton, Miss., to mouth of Red River, including Palmyra Island, to be called Lower Tensas levee district.

10. The district on the right bank extending from Red River to Bayou Lafourche, to be called Atchafalaya levee district.

11. The district on the right bank extending from Bayou Lafourche to Orleans levee district, 968 R., to be called Lafourche levee district.

12. The district on the right bank extending from Orleans levee district, 982 R., to the Gulf, to be called Barataria levee district.

13. The district on the left bank extending from Baton Rouge to Orleans levee district, 960 L., to be called Pontchartrain levee district.

14. The district on the left bank, extending from Orleans levee district, 972 L., to the Gulf, to be called Lake Borgne levee district.

Progress on levee work has been greatly retarded by the unusually wet season, and the almost continuous series of high river stages. The lower situation generally has been fair.

The following table, which is similar to that given in the Commission's report for 1905 has been brought up to date and shows the present condition of the levees, and the levee operations during the past year, as compiled from the reports of the district officers:

Levee district.	In system.	Built.	Contents, 1906.	Built since by United States.	Built since by local authorities.	Total built since 1906.
	Miles.	*Miles.*	*Cubic yards.*	*Cubic yards.*	*Cubic yards.*	*Cubic yards.*
Upper St. Francis	a 54.00	16.50	1,318,411	.....	20,000	20,000
Reelfoot	20.00	13.50	1,068,761	147,600	.....	147,600
Lower St. Francis	210.00	210.00	19,306,716	245,443	879,378	1,124,821
Upper Yazoo	124.00	124.00	26,389,577	34,604	693,972	728,576
White River	74.00	72.00	9,657,706	96,838	.....	96,838
Lower Yazoo	188.90	188.90	38,356,092	294,924	619,715	914,639
Upper Tensas	194.00	190.20	34,005,691	208,626	349,391	558,017
Lower Tensas	161.53	152.42	19,930,299	601,089	779,072	1,380,161
Atchafalaya	128.60	128.60	21,250,815	391,489	562,471	953,960
Pontchartrain	125.62	125.62	16,982,213	232,707	328,709	561,416
Lafourche	82.20	82.20	8,909,283	18,978	368,729	387,707
Lake Borgne	77.1	77.1	3,748,499	36,584	58,198	94,782
Barataria	71.9	71.9	3,216,604	25,858	44,755	70,613
Total	1,511.85	1,452.94	204,140,667	2,334,740	4,704,390	7,039,130

a This is length and yardage of levee in district below Birds Point. The total length of levee including that in the recently extended limits to Cape Girardeau has not yet been determined.

Levee district.	Lost or abandoned during the year.	Contents, 1907.	Required to complete.	Estimated final contents.	Percentage now built.
	Cubic yards.	*Cubic yards.*	*Cubic yards.*	*Cubic yards.*	
Upper St. Francis	.....	1,338,411	4,124,137	a 5,462,548	25
Reelfoot	.....	1,216,361	1,089,053	2,305,414	53
Lower St. Francis	15,870	20,415,667	4,082,014	24,497,681	83
Upper Yazoo	.....	27,118,153	550,378	27,668,531	98
White River	.....	9,754,544	6,883,674	16,638,218	59
Lower Yazoo	45,500	39,225,231	10,730,861	49,956,092	79
Upper Tensas	.....	34,563,708	13,651,000	48,214,708	72
Lower Tensas	274,600	21,035,860	9,463,136	30,498,996	69
Atchafalaya	469,800	21,734,975	3,504,840	25,239,815	86
Pontchartrain	58,552	17,485,077	4,141,821	21,626,898	81
Lafourche	150,350	9,146,640	2,095,840	11,242,480	81
Lake Borgne	57,800	3,785,481	676,117	4,461,598	85
Barataria	6,600	3,280,617	571,231	3,851,848	85
Total	1,079,072	210,100,725	61,564,102	271,664,827	77

a This is length and yardage of levee in district below Birds Point; the total length of levee including that in the recently extended limits to Cape Giraudeau has not yet been determined.

The "estimated final contents" of the levees given above is based on grades and sections as heretofore provisionally recommended by the Commission. It is expected that these tentative grades will be revised and new grades adopted in the near future, as recent flood profiles have furnished new data which will enable this to be done.

The loss of levee by abandonment on account of caving river banks or for other causes during the past year, as shown in the above table was 1,079,072 cubic yards, which amounts to a little over one-half of 1 per cent of the contents of the existing levees. The report of 1906 states that this loss amounted to nine-tenths of 1 per cent in that year, and about 2½ per cent the year before. A statement of the policy of the Commission, which is accountable, in part at least, for the successively smaller percentages of loss, will be found on page 2484 of last year's report of the Commission, together with a discussion of the subject.

For details of levee operations during the year, reference is made to the reports of the district officers hereto appended.

REVETMENTS FOR THE PROTECTION OF LEVEES AND THEIR IMPORTANCE IN THE DEVELOPMENT OF NAVIGABLE CHANNELS.

A brief reference was made in the last annual report of the Commission to the use of bank revetment for the protection of levees. The increasing interest and importance of the subject will justify some further discussion of it here.

Bank revetments are such expensive work that it is only in extreme cases that the use of them is permissible for the mere protection of levees. But a situation is sometimes presented in which a levee occupying what may be called a strategic point in the line—usually between the river and a lake—is so threatened by the advance of a caving bend that it is either to arrest caving by revetment, or abandon the levee and build a new line. This may be a long one around and behind a lake and across swamps or old river beds where almost insuperable difficulties of construction must be encountered.

In such a case it is sometimes wise economy to build a revetment and to save the levee.

The first work of that sort done under the recommendation of the Commission was at Bolivar, in Mississippi, 417 miles below Cairo, in 1888. The work has been entirely successful, having held the bank now for nineteen years, with some, but not extensive, extensions and repairs.

Another revetment for levee protection was built at Lake Providence, in Louisiana, 540 miles below Cairo, in 1894; another in Bondurant Chute, Louisiana, 644 miles, in 1899; and another in Kempe Bend, Louisiana, 658 miles, in 1899.

In each of these cases the abandonment of the levee would have involved the building of a long and very costly new line and the throwing out of a large area of valuable cultivated land. In the case of the Lake Providence levee it would have involved the throwing out of all, or a large part, of the town of Lake Providence.

In addition to the expense of replacing an abandoned levee (which has been increased greatly by the growing height and cost of levees in recent years) there is to be considered the fact that such a change usually results in opening a high-water path across the point below, which is liable to affect the regimen of the river injuriously for a considerable distance both above and below. Each such change also introduces a wide place in the high-water channel with injurious effects on the low-water channel.

In view of these considerations the Commission has recommended the construction of revetment for the protection of levees more frequently within a few years past than formerly. Beginning with Longwood, Miss., 500 miles below Cairo, in 1904, revetments have been undertaken in Old Town Bend, Arkansas, 324 miles below Cairo; Fitlers Bend, Mississippi, 552 miles, and Reid-Bedford Bend, Louisiana, 605 miles. Further details regarding these works are given in the preceding pages of this report.

Now, in the progress of events, another consideration has come into view. It seems apparent from the expressions of public opinion on the subject, and the action which has been taken by the Government, that much larger demands may be made in the future on the channel below Cairo than those of the past or present. To meet these successfully will require a more complete conservation of the channel-making forces of the river and a more effectual removal of obstructions to its navigation than have been hitherto attained. In the attainment of these ends the same works will contribute at the same time to the protection of levees and the improvement of the channel. That will occur in this way: The obstructions to navigation are the bars; the bars are formed from material scoured out of the banks, and, for the greater part, out of caving bends not very far upstream. The prevention of this scour in the bends will diminish the supply of bar building material at the crossings, and so may be expected to diminish the growth and height of the bars.

It is certain that any plan for the maintenance of a good navigable channel in the Mississippi below Cairo will have to include dredging on the bars. But the surest road to large success will be, first, to prevent, as far as possible, the growth of the bars, and then remove the unpreventable deposits by dredging. With such a scheme in mind, the formation of high-water paths across abandoned points assumes greater importance than has hitherto been attached to it. The abandonment of the threatened levees in the great bends would

result in a high-water channel throughout the river of extremely irregular width—ranging from a few thousand feet to many miles. The effect of such an irregularity of high-water width upon the low-water channel could not but be highly injurious.

The revetment of caving bends is, in a sense, a resumption of work under the original plan of the Commission. That plan contemplated a general improvement of the channel for navigation from Cairo down, to be accomplished chiefly by regulation of low-water width. For this purpose it was proposed, in the final treatment of the problem, to revet all caving banks where the effect of the caving was to injuriously widen the channel. After having pursued that plan in Plum Point and Lake Providence reaches for about sixteen years, it became clear that its successful application to the general improvement of the channel was impracticable within any such limits of expenditure as the Commission could at that time recommend or Congress would be likely to approve, and it was discontinued. As a means of improving the channel, the works executed in those two reaches were highly successful. The improved conditions have remained in large degree to this day. In particular it is to be observed that improved conditions have existed for a large part of the distance between Plum Point reach and Memphis, which suggests that the effect of holding the caving bends in the reach above has been to diminish the activity of bar building for a considerable distance below. Since those days the development of the levee system and the consequent growth of the vast interests which depend upon its secure maintenance have immensely enlarged the scope of the problem. It will be quite prudent and conservative to build revetments for the protection of levees now in some places where it would not have been justifiable ten years ago. If we add to this the fact that the Government is likely to undertake in the near future the securing of a channel of larger capacity than was formerly contemplated, the importance of holding the bends is still further emphasized. The letting go now of a few threatened levees would deform the high-water channel to an extent that would make its restoration to present favorable conditions impossible.

The considerations which have been stated point also to the good policy of improving the work of dredging by the use of dredges of more perfect construction and greater reach and power than those heretofore built, notwithstanding the fact that they have been excellent machines and better and better as one after another has been designed and constructed. But still larger and more powerful dredges will probably be necessary if any considerable increase of depth shall be required in the future, and useful, even if that should not be the case. The failure of commerce to respond to the improved conditions of the channel which have been maintained for a number of years past is disappointing. It can be accounted for only on the theory that confidence in the permanence of the improvement still hesitates. To go on to more perfect mastery of the conditions, to hold the banks with greater security, to build and operate more powerful dredges if need be, and to increase the depth of the channel from year to year, will invite and stimulate that confidence without which the restoration and much more, the large expansion of commerce on the river will be impossible.

HIGH WATER.

The flood stage reached at Cairo in 1907 has only been exceeded six times during the past forty years. It was only 1.8 feet below the highest known stage at that point, and yet it was carried down the river a distance of 975 miles, guided and controlled by the levee system, which is still incomplete, without a single break therein.

The high water came unusually early in 1907, abnormally high stages having also prevailed in November and December, 1906, the river channels were already well filled. The river at Cairo began to rise rapidly early in January, caused by freshets in the Ohio, Cumberland, and Tennessee rivers, and reached 42.7 feet on January 10. About this time heavy precipitation occurred over nearly the entire watershed of the Ohio River except in the Tennessee Valley. This caused a flood in the Ohio River, which, from Cairo to about 200 miles above Cincinnati, has only been exceeded by the great floods of 1883 and 1884. A flood also occurred at this time in the Illinois River, and a freshet in the lower Missouri. A hard freeze came on while the flood was in progress which materially checked the rise in all the tributaries north of Cairo, and undoubtedly prevented a greater flood in the main river. The gauge reading at Cincinnati on January 21, 1907, was 65.1 feet and the maximum gauge reading at Cairo was 50.33 feet on January 27. All the tributaries above Red River were at fairly high stages in January; the White River was above the flood stage of 30 feet at Clarendon from the 5th to the 26th, but the crest reached the Mississippi in advance of the crest in the main river. The Ouachita also was high early in January, but the Red River was at only a moderate stage throughout January and February.

The duration of this flood was comparatively short at the head of the main valley, but was somewhat increased at the lower stations by the early flood in the White River. At Cairo the river was above the 45-foot stage for sixteen days; at Memphis it was above 33 feet for twenty-two days; at Helena, above 42 feet for thirty-four days; at Arkansas City, above 42 feet for forty-three days; at Carrollton the river was above 15 feet for forty-five days.

No breaks occurred in the main lines of levees above New Orleans during the passage of this flood. On February 21 a break occurred in the levee line of the Barataria district, about 28 miles below New Orleans; this was closed on March 23. During the height of the flood, water escaped through some of the numerous small breaks below Fort St. Philip made by the Gulf storm of last September; these breaks have not yet been closed.

As compared with the flood of 1903, this flood was somewhat lower at Cairo, higher at Memphis, averaged about a foot lower in the third district and averaged about 2 feet lower in the fourth district. In the latter district the range in difference was considerable, 1907 being about 3 feet lower than 1903 near the mouth of Red River, and about 0.3 foot higher than 1903 at Fort Jackson.

A secondary flood occurred in March and April, coming largely from the Ohio River, the rivers at Pittsburg reaching a higher stage than was ever before recorded. The stages in the Mississippi River at and below Cairo fell short of the first rise by about 4 feet.

Careful preparations were made in January for protecting the levees, and the patrol of the lines was continued until the flood stage had passed.

For details concerning the protection of levees, attention is invited to the reports of the district officers, hereto appended.

The Commission is of the opinion that the sum of $3,000,000 in addition to available balances on July 1, of this year can be profitably expended for continuing the improvement of the Mississippi River from the Head of the Passes to the mouth of the Ohio River during the fiscal year ending June 30, 1909.

Respectfully submitted.

CLINTON B. SEARS,
Colonel, Corps of Engineers, U. S. Army,
President, Mississippi River Commission.

ROBERT S. TAYLOR,
J. A. OCKERSON,
HENRY B. RICHARDSON,
HOMER P. RITTER,
Assistant U. S. Coast and Geodetic Survey.

WM. T. ROSSELL,
Lieut. Col., Corps of Engineers, U. S. Army.

J. G. WARREN,
Major, Corps of Engineers, U. S. Army.

Brig. Gen. A. MACKENZIE,
Chief of Engineers, U. S. A.

Money statements.

APPROPRIATIONS EXPENDED UNDER MISSISSIPPI RIVER COMMISSION.

Appropriation for improving Mississippi River.

July 1, 1906, balance unexpended		[a] $3,385,554.06
Amount appropriated by river and harbor act approved March 2, 1907	$3,000,000.00	
Miscellaneous receipts from reimbursements, sales of engineer property under the provisions of section 5 of river and harbor act of June 13, 1902, and other sales	9,883.17	
		3,009,883.17
		6,395,437.23
June 30, 1907, amount expended during fiscal year		1,616,247.83
July 1, 1907, balance unexpended		4,779,189.40
July 1, 1907, outstanding liabilities	$80,987.18	
July 1, 1907, amount covered by uncompleted contracts	1,772,660.89	
		1,853,648.07
July 1, 1907, balance available		2,925,541.33

[a] The amount, $3,385,540.30, reported in Annual Report for 1906, has been increased $13.76 during the fiscal year by the following refundments of overpayments:

By first and second districts officer:	
November, 1906, allotment for "Upper St. Francis levee district"	$0.33
By fourth district officer:	
July, 1906, allotment for "Lower Tensas levee district"	13.33
March, 1907, allotment for "Pontchartrain levee district"	.10
	13.76

Distributed as follows:	
Mississippi River Commission	$31,822.66
Surveys, gauges, and observations	84,060.39
Levees	1,173,854.21
Revetment and contraction works, permanent channel improvements and protection	752,065.87
Dredges and dredging	334,382.82
Plant and miscellaneous	192,481.05
Improving harbors and tributaries	273,874.33
Unallotted	83,000.00
	2,925,541.33

Amount necessary to be appropriated for the fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907.

For continuing the improvement of the Mississippi River from Head of the Passes to the mouth of the Ohio River, including salaries and clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission	$3,000,000.00

Appropriation for gauging waters of the Mississippi River and its tributaries.[a]

July 1, 1906, balance unexpended		$2,742.63
Amount allotted by Chief of Engineers, July 2, 1906, from permanent indefinite appropriation made by section 6 of river and harbor act of August 11, 1888, as amended by section 9 of river and harbor act of June 13, 1902		9,100.00
		11,842.63
June 30, 1907, amount expended during fiscal year	$7,189.00	
June 30, 1907, amount reverted to Treasury during fiscal year	1,753.11	
		8,942.11
July 1, 1907, balance unexpended		2,900.52
July 1, 1907, outstanding liabilities		2,057.34
July 1, 1907, balance reverting to Treasury		843.18
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907		9,100.00

CONSOLIDATED STATEMENT OF ALL APPROPRIATIONS EXPENDED UNDER THE MISSISSIPPI RIVER COMMISSION, TO JUNE 30, 1907.

Appropriation for improving Mississippi River.

Act of June 28, 1879 (organic)	$175,000.00
Act of June 16, 1880 (sundry civil)	150,000.00
Act of March 3, 1881 (river and harbor)	1,000,000.00
Act of March 3, 1881 (sundry civil)	150,000.00
Act of August 2, 1882 (river and harbor)	4,123,000.00
Act of August 7, 1882 (sundry civil)	150,000.00
Act of March 3, 1883 (sundry civil)	150,000.00
Act of January 19, 1884 (river and harbor)	1,000,000.00
Act of July 5, 1884 (river and harbor)	75,000.00
Act of July 5, 1884 (river and harbor), less $5,000 transferred to snag-boat service	2,065,000.00
Act of July 7, 1884 (sundry civil)	75,000.00

[a] The custody and care of the gauges maintained under this appropriation were assumed by the Mississippi River Commission February 11, 1901, on which date they were transferred to the secretary, under authority of Secretary of War, dated January 25, 1901.

Act of August 5, 1886 (river and harbor), less $5,942.60 for expenses, office Chief of Engineers		$1,994,057.40
Act of August 5, 1886 (river and harbor), less $47.30 for expenses, office Chief of Engineers		29,952.70
Act of August 11, 1888 (river and harbor), less $4,859 for expenses, office Chief of Engineers		2,840,141.00
Act of August 11, 1888 (river and harbor)		75,000.00
Act of October 2, 1888 (sundry civil)		35,000.00
Act of October 19, 1888 (deficiency), less $4,214.39 reverted to the Treasury		20,785.61
Act of September 19, 1890 (river and harbor)		3,200,000.00
Act of September 30, 1890 (deficiency)		5,625.00
Act of March 3, 1891 (deficiency)		1,950.00
Act of March 3, 1891 (joint resolution)		1,000,000.00
Act of July 13, 1892 (river and harbor)		2,470,000.00
Act of July 28, 1892 (deficiency)		44.80
Act of March 3, 1893 (sundry civil)		2,665,000.00
Act of August 18, 1894 (river and harbor)		485,000.00
Act of August 18, 1894 (sundry civil)		2,665,000.00
Act of March 2, 1895 (sundry civil)		2,665,000.00
Act of June 3, 1896 (river and harbor)		909,000.00
Joint resolution approved March 31, 1897 (Public—No. 6)		250,000.00
Act of June 4, 1897 (sundry civil)		2,933,333.00
Act of July 19, 1897 (deficiency)		625,000.00
Act of July 1, 1898 (sundry civil)		1,983,333.00
Act of March 3, 1899 (sundry civil)		2,583,333.00
Act of March 3, 1899 (river and harbor)		185,000.00
Act of June 6, 1900 (sundry civil), less $5,000 for expenses, office Chief of Engineers		2,245,000.00
Act of June 13, 1902 (river and harbor)		2,200,000.00
Act of March 3, 1903 (sundry civil)		2,000,000.00
Act of April 28, 1904 (sundry civil)		2,000,000.00
Act of March 3, 1905 (river and harbor)		1,000,000.00
Act of March 3, 1905 (sundry civil)		2,000,000.00
Act of June 30, 1906 (sundry civil)		2,000,000.00
Act of March 2, 1907 (river and harbor)		3,000,000.00
Total specific appropriations		55,179,555.51
Balances from former appropriations applied to works below Cairo under act of August 2, 1882, less $123.42 reverted to Treasury	$272,504.96	
Same for works above Cairo, under act of July 5, 1884	22,632.53	
Total balances		295,137.49
Miscellaneous receipts:		
Previously reported	$25,228.07	
Amount collected and deposited by the Department of Justice on account of compromise of claim of the United States for damages sustained by the U. S. steamer *Unique*, credited to "Plant," first and second districts, March, 1907	25.00	
Amount received by Treasury settlement No. 6584-b, February 6, 1907, for work done at New Orleans naval station, credited to "Atchafalaya and Red rivers, La.," fourth district, February, 1907	8,666.42	
Amounts received from sales under the provisions of section 5 of river and harbor act of June 13, 1902, and sales of blueprints:		
By secretary—		
From sale of engineer property to the International Waterways Commission, credited to "Mississippi River Commission," December, 1906	292.75	
From sale of blueprints in April, 1907, credited to "Surveys, gauges, and observations," May, 1907	5.42	

Amounts received from sales under the provisions of section 5—Continued.		
By first and second districts officer—		
From sale of condemned engineer property in October, 1906, credited to "Plant," October, 1906	$316.50	
By fourth district officer—		
From sales of blueprints in August, 1906, credited to "Natchez and Vidalia harbors, Mississippi and Louisiana," August, 1906	.60	
From sale of condemned engineer property in September, 1906, credited to "Plant," October, 1906	570.95	
From sales of blueprints in October, 1906, credited to "Natchez and Vidalia harbors, Mississippi and Louisiana," October, 1906	1.50	
From sales of blueprints in December, 1906, credited to "New Orleans Harbor, Louisiana," December, 1906	.25	
From sales of blueprints in January, 1907, 50 cents credited to "Surveys, gauges, and observations," and 50 cents credited to "Lower Tensas levee district," January, 1907	1.00	
From sales of blueprints in February, 1907, credited to "New Orleans Harbor, La.," February, 1907	.25	
From sales of blueprints in April, 1907, credited to "Pontchartrain levee district," April, 1907	.25	
From sales of blueprints in May, 1907, credited to "Surveys, gauges, and observations," May, 1907	2.28	
Total miscellaneous receipts		$35,111.24
Total		55,509,804.24

EXPENDED.

Location and object.	To June 30, 1906.	During year ending June 30, 1907.	Total.
Mississippi River Commission	[a] $770,483.13	$32,534.11	$803,017.24
Surveys, gauges, and observations	2,237,850.62	73,391.02	2,311,241.64
Levees	[b] 20,612,303.30	622,350.52	21,234,653.82
Revetment and contraction works, permanent channel improvements and protection	11,256,650.37	303,131.28	11,559,781.65
Dredges and dredging	[c] 3,903,639.99	304,059.71	4,207,699.70
Experimental dikes	100,000.00	.....	100,000.00
Plant, and miscellaneous	2,542,357.08	147,633.21	2,689,990.29
Improving harbors and tributaries, except Vicksburg harbor	6,370,469.01	133,147.98	6,503,616.99
Improving Vicksburg harbor	582,980.98	.....	582,980.98
Works above Cairo	737,632.53	.....	737,632.53
Total expended	49,114,367.01	1,616,247.83	50,730,614.84
Balance unexpended June 30, 1907	.....	.....	4,696,189.40
Unallotted	.....	.....	83,000.00
Total appropriated, etc	.....	.....	55,509,804.24

[a] The amount, $770,480.93, reported in Annual Report for 1906, is increased $2.20 to correct clerical error in secretary's office in alloting expenditures.

[b] The amount, $20,612,317.06, reported in Annual Report for 1906, is reduced by the following refundments during the year:

By first and second districts officer—	
November, 1906, allotment for "Upper St. Francis levee district"	$0.33
By fourth district officer—	
July, 1906, allotment for "Lower Tensas levee district"	13.33
March, 1907, allotment for "Pontchartrain levee district"	.10
	13.76

[c] The amount, $3,903,642.19, reported in Annual Report for 1906, is reduced $2.20 to correct clerical error in secretary's office in alloting expenditures.

Appropriation for gauging waters of the Mississippi River and its tributaries.

Allotments from general appropriations for examinations, surveys, and contingencies of rivers and harbors by acts of—	
March 3, 1871	$5,000.00
June 10, 1872	5,000.00
March 3, 1873	5,000.00
June 23, 1874	5,000.00
March 3, 1875	5,000.00
Specific appropriations by river and harbor acts of—	
August 14, 1876	5,000.00
June 18, 1878	5,000.00
March 3, 1879	5,000.00
June 14, 1880	5,000.00
March 3, 1881	5,000.00
August 2, 1882	5,000.00
Deficiency act of March 12, 1884	2,100.00
Specific appropriations by river and harbor acts of—	
July 5, 1884	5,000.00
August 5, 1886	5,000.00
Allotted from specific appropriation by river and habor act of August 11, 1888	8,700.00
Deficiency act of October 19, 1888	3,600.00
Allotments from permanent indefinite appropriation made by section 6 of river and harbor act of August 11, 1888, for fiscal years—	
1890	9,000.00
1891 (less $3,518.34 withheld in United States Treasury under ruling that only $6,000 can be expended each fiscal year)	5,181.66
1892	5,100.00
1893	5,500.00
1894	5,500.00
1895	5,500.00
1896	5,500.00
1897	5,500.00
1898	5,500.00
1899	6,000.00
1900	5,500.00
1901	6,000.00
1902	6,000.00
Allotments from permanent indefinite appropriation made by section 6 of river and harbor act of August 11, 1888, as amended by section 9 of river and harbor act of June 13, 1902, for fiscal years—	
1903	9,100.00
1904	9,100.00
1905	9,100.00
1906	9,100.00
1907	9,100.00
Total	200,681.66

EXPENDED.

	To June 30, 1906.	During year ending June 30, 1907.	Total.
Expenditures	$179,757.22	$7,189.00	$186,946.22
Unexpended balances reverted to Treasury	9,081.81	1,753.11	10,834.92
Total	188,839.03	8,942.11	197,781.14
Unexpended balance June 30, 1907			2,900.52
Total appropriated, etc			200,681.66

Appropriation for repairing Government levee at Walnut Bend, Arkansas.[a]

Act of June 13, 1902 (river and harbor)	$90,000.00
Expended to June 30, 1906	90,000.00

Appropriation for waterway from Lockport, Ill., to St. Louis, Mo.

Act of June 13, 1902 (river and harbor)	$25,000.00
Amount transferred from allotment for "Survey of Illinois and Des Plaines river, Ill.," as reimbursement	1,093.40
Total	26,093.40

EXPENDED.

	To June 30, 1906.	During year ending June 30, 1907.	Total.
Expenditures	$22,291.23		$22,291.23
Unexpended balance reverting to Treasury			[a] 3,802.17
Total appropriated, etc			26,093.40

[a] Less $6.50 outstanding liabilities (unclaimed wages).

Appropriation for emergencies in river and harbor works.

Allotments from appropriation by act of April 28, 1904:	
For Wolf River	$8,000.00
For Giles Bend, Miss	40,000.00
	48,000.00
Expended in fiscal year 1905	48,000.00

Appropriation for examinations, surveys, and contingencies of rivers and harbors.

Allotments from appropriation by river and harbor act of March 3, 1905:	
For Ashport, Tenn	$485.00
Expended in fiscal year 1906	485.00

[a] Prior to June 30, 1906, was reported under appropriation for "Improving Mississippi River."

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907.

SECRETARY, MISSISSIPPI RIVER COMMISSION.

[Appropriations: Improving Mississippi River; gauging waters of the Mississippi River and its tributaries; waterway from Lockport, Ill., to St. Louis, Mo.]

	Appropriation for improving Mississippi River, allotment for—				
	Mississippi River Commission.	Surveys, gauges, and observations.	Dredges and dredging.	Expended allotments.	Total.
Amount expended on previous projects	$238,110.74	$855,247.37	.....	.....	$1,093,358.11
Amount expended on present project to end of last fiscal year	532,372.39	1,045,901.76	$3,513,035.88	[a]$46,131.14	5,137,441.17
Balance unexpended at end of last fiscal year	1,116.61	15,073.17	276,545.69	.....	292,735.47
Amount appropriated or allotted since (net)	[b]65,792.75	[c]110,505.42	[d]456,781.07	.....	633,079.24
	66,909.36	125,578.59	733,326.76	.....	925,814.71
Amount expended from beginning of present fiscal year to end of previous month	28,011.47	53,133.59	270,386.59	.....	351,531.65
Amount expended during the month	4,522.64	4,532.69	33,673.12	.....	42,728.45
	32,534.11	57,666.28	304,059.71	.....	394,260.10
Balance unexpended at end of month	34,375.25	67,912.31	429,267.05	.....	531,554.61
In Treasury United States	30,500.00	63,505.42	366,129.50	.....	460,134.92
In hand	3,875.25	4,406.89	63,137.55	.....	71,419.69
	34,375.25	67,912.31	429,267.05	.....	531,554.61
Outstanding liabilities at end of month	2,552.59	6,247.27	14,974.59	.....	23,774.45
Amount covered by existing contracts at end of month	.....	.....	79,909.64	.....	79,909.64
	2,552.59	6,247.27	94,884.23	.....	103,684.09
Balance available at end of month	31,822.66	61,665.04	334,382.82	.....	427,870.52

[a] Experimental dikes, $45,075.58; patrol of the Mississippi River, $1,055.56.

[b] Amount previously reported increased $20,500. Allotments from appropriation by river and harbor act of March 2, 1907, by resolution of the Mississippi River Commission, June 26, 1907.

[c] Amount previously reported increased $58,500. Allotments from appropriation by river and harbor act of March 2, 1907, by resolution of the Mississippi River Commission, June 26, 1907.

[d] Amount previously reported increased $245,000. Allotments from appropriation by river and harbor act of March 2, 1907, by resolution of the Mississippi River Commission, June 26, 1907. Amount previously reported increased $1,794.92, transferred from allotments of first and second districts in payment for coal purchased from secretary in May, 1907. Transfer approved by Chief of Engineers, June 19, 1907. (ED 60343–6, Sec. MRC 354–26.)

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

SECRETARY MISSISSIPPI RIVER COMMISSION—continued.

	Appropriation for gauging waters of the Mississippi River and its tributaries.	Appropriation for waterway from Lockport, Ill., to St. Louis, Mo.	Grand total.
Amount expended on previous projects	.....	.....	$1,093,358.11
Amount expended on present project to end of last fiscal year	$179,757.22	$22,291.23	5,339,489.62
Balance unexpended at end of last fiscal year	2,742.63	3,802.17	299,280.27
Amount appropriated or allotted since (net)	9,100.00	.....	642,179.24
	11.842.63	3,802.17	941,459.51
Amount expended from beginning of present fiscal year to end of previous month	6,646.50	.....	358,178.15
Amount expended during the month	542.50	.....	43,270,95
	7,189.00	.....	401,449.10
Balance unexpended at end of month	[a] 2,900.52	3,802.17	538,257.30
In Treasury United States	1,100.00	3,802.17	465,037.09
In hand	1,800.52	.....	73,220.21
	2,900.52	3,802.17	538,257.30
Outstanding liabilities at end of month	2,057.34	6.50	25,838.29
Amount covered by existing contracts at end of month	.....	.....	79,909.64
	2,057.34	6.50	105,747.93
Balance available at end of month	843.18	3,795.67	432,509.37

[a] $1,753.11 of the unexpended balance for 1906 reverts to the Treasury.

WORKS ABOVE CAIRO.

[Appropriation: Improving Mississippi River.]

	Protection near Cairo.[a]	Des Moines Rapids to Ohio River.	Total.
Amount expended on present project to end of last fiscal year	$50,000.00	$687,632.53	$737,632.53

[a] Includes only work under act of July 5, 1884.

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

FIRST AND SECOND DISTRICTS.

[Appropriations: Improving Mississippi River; repairing Government levee at Walnut Bend, Arkansas; emergencies in river and harbor works; examinations, surveys, and contingencies of rivers and harbors.]

	Improving Mississippi River, allotment for—				
	Surveys.	Upper St. Francis levee district.	Lower St. Francis levee district.	White River levee district.	Reelfoot levee district.
Amount expended on present project to end of last fiscal year	$121,729.50	$124,224.09	$1,822,451.93	$1,620,272.71	$70,000.00
Balance unexpended at end of last fiscal year	2,443.61	5,775.91	49,475.07	95,461.89	.....
Amount appropriated or allotted since (net)	[a] 9,802.00	[b] 230,000.00	[c] 364,098.42	[d] 229,885.00	100,000.00
	12,245.61	235,775.91	413,573.49	325,346.89	100,000.00
Amount expended from beginning of present fiscal year to end of previous month	5,500.08	2,119.91	62,776.36	55,767.78	32,309.75
Amount expended during the month	128.41	76.30	6,665.94	2,436.81	4,546.12
	5,628.49	2,196.21	69,442.30	58,204.59	36,855.87
Balance unexpended at end of month	6,617.12	233,579.70	344,131.19	267,142.30	63,144.13
In Treasury United States	6,000.00	225,000.00	334,095.91	254,885.00	53,000.00
In hand	617.12	8,579.70	10,035.28	12,257.30	10,144.13
	6,617.12	233,579.70	344,131.19	267,142.30	63,144.13
Outstanding liabilities at end of month	217.12	200.00	3,000.00	250.00	350.00
Amount covered by existing contracts at end of month	.....	177,135.00	262,986.00	47,561.97	60,151.74
	217.12	177,335.00	265,986.00	47,811.97	60,501.74
Balance available at end of month	6,400.00	56,244.70	78,145.19	219,330.33	2,642.39

[a] Amount previously reported increased during month $5,000. Allotments from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., pp. 1241, 1243.)

[b] Amount previously reported increased during month $45,000. Allotments from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., pp. 1241, 1243.)

[c] Amount previously reported decreased during month $402.50. Transfers to secretary in payment for coal purchased, approved by Chief of Engineers, June 19, 1907. (ED 60343-6.)

[d] Amount previously reported decreased during month $115. Transfers to secretary in payment for coal purchased, approved by Chief of Engineers, June 19, 1907. (ED 60343-6.)

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

FIRST AND SECOND DISTRICTS—continued.

	Improving Mississippi River, allotment for—				
	Upper Yazoo levee district.	Plum Point reach.	Walnut Bend, Ark.	Old Town Bend, Ark.	Plant.
Amount expended on present project to end of last fiscal year	$1,899,947.49	$5,351,526.22	.....	.....	$1,092,286.46
Balance unexpended at end of last fiscal year	36,404.29	9,134.40	.....	.....	2,490.47
Amount appropriated or allotted since (net)	.....	[a] 29,814.38	[b] $123,707.66	[c] $189,177.97	[d] 107,820.88
	36,404.29	38,948.78	123,707.66	189,177.97	110,311.35
Amount expended from beginning of present fiscal year to end of previous month	6,538.64	1,280.85	17,339.27	11,138.57	34,270.02
Amount expended during the month	10.75	.....	[e] 70.86	[f] 174.46	8,521.62
	6,549.39	1,280.85	17,410.13	11,313.03	42,791.64
Balance unexpended at end of month	29,854.90	37,667.93	106,297.53	177,864.94	67,519.71
In Treasury United States	9,000.00	34,814.38	106,137.32	169,032.64	59,632.58
In hand	20,854.90	2,853.55	160.21	8,832.30	7,887.13
	29,854.90	37,667.93	106,297.53	177,864.94	67,519.71
Outstanding liabilities at end of month	400.00	.....	100.00	300.00	10,000.00
Amount covered by existing contracts at end of month	20,705.60	.....	.....	44,600.00	.....
	21,105.60	.....	100.00	44,900.00	10,000.00
Balance available at end of month	8,749.30	37,667.93	106,197.53	132,964.94	57,519.71

[a] Amount previously reported increased during month $25,000. Allotments from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., p. 1243.)

[b] Amount previously reported increased during month $100,000. Allotments from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., p. 1243.) Amount previously reported decreased during month $633. Transfers to secretary in payment for coal purchased, approved by Chief of Engineers, June 19, 1907. (ED 60343-6.)

[c] Amount previously reported decreased during month $162. Transfers to secretary in payment for coal purchased, approved by Chief of Engineers, June 19, 1907. (ED 60343-6.)

[d] Amount previously reported decreased during month $162. Transfers to secretary in payment for coal purchased, approved by Chief of Engineers, June 19, 1907. (ED 60343-6.)

[e] Includes $34.19. Paid by Treasury settlement No. 35749, to Chicago, Rock Island and Pacific Ry. Co., for freight transportation.

[f] Includes $9.08. Paid by Treasury settlement No. 35749, to Chicago, Rock Island and Pacific Ry. Co., for freight transportation.

Consolidated statement of condition of appropriations lotments under Mississippi River Commission on June 30, 1907— nued.

FIRST AND SECOND DISTRICTS—continued.

	Improving Mississippi River, allotment for—				
	At Hickman, Ky.	At New Madrid, Mo.	Caruthersville, Mo.	Hopefield Bend (preservation of works at).	At Helena, Ark.
Amount expended on present project to end of last fiscal year	$94,759.73	$150,479.15	$75,000.00	$396,343.92	$210,[illegible].67
Balance unexpended at end of last fiscal year	372.27	2,520.85	.....	10,284.83	1,086.33
Amount appropriated or allotted since (net)	.....	.....	4,814.37	[a] 37,000.00	.....
	372.27	2,520.85	4,814.37	47,284.83	1,086.33
Amount expended from beginning of present fiscal year to end of previous month	.....	.....	3,225.04	3,057.66	.....
Amount expended during the month	.....	.....	.....	.....	.....
	.....	.....	3,225.04	3,057.66	.....
Balance unexpended at end of month	372.27	2,520.85	1,589.33	44,227.17	1,086.33
In Treasury United States	.....	1,000.00	314.37	43,000.00	.....
In hand	372.27	1,520.85	1,274.96	1,227.17	1,086.33
	372.27	2,520.85	1,589.33	44,227.17	1,086.33
Outstanding liabilities at end of month	.....	.....	.....	.....	.....
Amount covered by existing contracts at end of month	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....
Balance available at end of month	372.27	2,520.85	1,589.33	44,227.17	1,086.33

[a] Allotment from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., p. 1243.)

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

FIRST AND SECOND DISTRICTS—continued.

	Improving Mississippi River, allotment for—			Expended appropriations.	Grand total.
	At Memphis, Tenn. (Wolf River).	Expended allotments.	Total.		
Amount expended on present project to end of last fiscal year	$22,452.93	[a] $2,168,878.20	$14,220,766.00	[b] $98,485.00	$14,319,251.00
Balance unexpended at end of last fiscal year	[c] 3,333.07	.....	218,782.99	.....	218,782.99
Amount appropriated or allotted since (net)	.....	.....	1,426,120.68	.....	1,426,120.68
	3,333.07	.....	1,644,903.67	.....	1,644,903.67
Amount expended from beginning of present fiscal year to end of previous month	1,015.42	.....	236,339.35	.....	236,339.35
Amount expended during the month	.....	.....	22,631.27	.....	22,631.27
	1,015.42	.....	258,970.62	.....	258,970.62
Balance unexpended at end of month	2,317.65	.....	1,385,933.05	.....	1,385,933.05
In Treasury United States	1,285.00	.....	1,297,197.20	.....	1,297,197.20
In hand	1,032.65	.....	88,735.85	.....	88,735.85
	2,317.65	.....	1,385,933.05	.....	1,385,933.05
Outstanding liabilities at end of month	.....	.....	14,817.12	.....	14,817.12
Amount covered by existing contracts at end of month	.....	.....	613,140.31	.....	613,140.31
	.....	.....	627,957.43	.....	627,957.43
Balance available at end of month	2,317.65	.....	757,975.62	.....	757,975.62

[a] Preservation of works, $54,867.89; Walnut Bend levee, preservation of works at, $28,200; removal of Nonconnah Rock, $9,000; dredges and dredging, $388,097.12; Columbus, Ky., $43,750; improving St. Francis River (Walnut Bend levee), $75,000; at Memphis, Tenn., $45,000; improving harbor at Memphis, Tenn., $1,425,038.77; improving harbor at Memphis, Tenn. (Wolf River), $45,000; dikes, $54,924.42.

[b] Repairing Government levee at Walnut Bend, Ark., $90,000; emergencies in river and harbor works (for Wolf River), $8,000; examinations, surveys, and contingencies of rivers and harbors, $485.

[c] Amount previously reported decreased during month $115, transfer to secretary in payment for coal purchased, approved by Chief of Engineers, June 19, 1907. (ED 60343-6.)

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907.—Continued.

THIRD DISTRICT.

[Appropriation: Improving Mississippi River.]

	Improving Mississippi River, allotment for—				
	Surveys.	Lower Yazoo levee district.	Upper Tensas levee district.	Ashbrook neck.	Lake Providence reach.
Amount expended on present project to end of last fiscal year	$103,923.67	$3,780,412.44	$5,002,333.81	$661,966.31	$3,865,503.38
Balance unexpended at end of last fiscal year	.....	107,862.23	80,323.99	23,956.87	28,391.39
Amount appropriated or allotted since (net)	a 15,000.00	385,000.00	390,000.00	15,000.00	25,000.00
	15,000.00	492,862.23	470,323.99	38,956.87	53,391.39
Amount expended from beginning of present fiscal year to end of previous month	4,968.75	86,675.61	74,754.25	38,788.25	18,902.14
Amount expended during the month	31.25	2,981.73	4,230.74	168.62	818.97
	5,000.00	89,657.34	78,984.99	38,956.87	19,721.11
Balance unexpended at end of month	10,000.00	403,204.89	391,339.00	.....	33,670.28
In Treasury United States	10,000.00	391,000.00	373,000.00	.....	33,000.00
In hand	.....	12,204.89	18,339.00	.....	670.28
	10,000.00	403,204.89	391,339.00	.....	33,670.28
Outstanding liabilities at end of month	.....	1,500.00	2,500.00	.....	150.00
Amount covered by existing contracts at end of month	.....	270,000.00	281,000.00	.....	.....
	.....	271,500.00	283,500.00	.....	150.00
Balance available at end of month	10,000.00	131,704.89	107,839.00	.....	33,520.28

a Amount previously reported increased during month $10,000. Allotment from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., p. 1243.)

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

THIRD DISTRICT—continued.

	Improving Mississippi River, allotment for—				
	Stone.	Repairs to revetment at Lake Providence and general repairs, including quarrying of stone.	Plant.	Greenville, Miss.	Lake Bolivar front.
Amount expended on present project to end of last fiscal year	$298,966.29	(a)	$1,072,882.38	$931,248.84	$206,051.97
Balance unexpended at end of last fiscal year	2,133.71	$18,325.06	458.68	908.55	2,128.15
Amount appropriated or allotted since (net)	b 80,000.00	c 30,000.00	210,000.00	15,000.00	45,000.00
	82,133.71	48,325.06	210,458.68	15,908.55	47,128.15
Amount expended from beginning of present fiscal year to end of previous month	39,087.83	18,325.06	53,046.72	11,676.83	6,948.45
Amount expended during the month	3,045.88	.....	7,998.16	1,943.79	1,637.94
	42,133.71	18,325.06	61,044.88	13,620.62	8,586.39
Balance unexpended at end of month	40,000.00	30,000.00	149,413.80	2,287.93	38,541.76
In Treasury United States	40,000.00	.....	138,000.00	.....	38,000.00
In hand	.....	.....	11,413.80	2,287.93	541.76
	40,000.00	30,000.00	149,413.80	2,287.93	38,541.76
Outstanding liabilities at end of month	.....	.....	11,000.00	500.00	265.00
Amount covered by existing contracts at end of month	.....	.....	76,000.00	.....	.....
	.....	.....	87,000.00	500.00	265.00
Balance available at end of month	40,000.00	30,000.00	62,413.80	1,787.93	38,276.76

[a] $7,026.91 expended in fiscal year 1906 distributed to following works: Surveys, $300; Ashbrook Neck, $44.19; Lake Providence reach, $152.86; Plant, $55.71; Greenville, Miss., $14.25; Lake Bolivar front, $6,406.55; Longwood, Miss., $53.35.

[b] Amount previously reported increased during month $40,000. Allotment from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., p. 1243.)

[c] Allotment from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., p. 1243.)

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

THIRD DISTRICT—continued.

	Improving Mississippi River, allotment for—				
	Longwood, Miss.	Fitlers bend.	Reid-Bedford bend.	Expended allotments.	Total.
Amount expended on present project to end of last fiscal year	$156,183.41	.....	.....	[a] $628,980.98	$16,708,453.48
Balance unexpended at end of last fiscal year	28,869.94	.....	.....	.....	293,358.57
Amount appropriated or allotted since (net)	.....	$97,500.00	$190,000.00	.....	1,497,500.00
	28,869.94	97,500.00	190,000.00	.....	1,790,858.57
Amount expended from beginning of present fiscal year to end of previous month	826.87	5,519.29	85,876.71	.....	445,396.76
Amount expended during the month	.....	.....	289.17	.....	23,146.25
	826.87	5,519.29	86,165.88	.....	468,543.01
Balance unexpended at end of month	28,043.07	91,980.71	103,834.12	.....	1,322,315.56
In Treasury United States	27,000.00	87,500.00	95,000.00	.....	1,262,500.00
In hand	1,043.07	4,480.71	8,834.12	.....	59,815.56
	28,043.07	91,980.71	103,834.12	.....	1,322,315.56
Outstanding liabilities at end of month	100.00	.....	.....	.....	16,015.00
Amount covered by existing contracts at end of month	.....	12,200.00	5,500.00	.....	644,700.00
	100.00	12,200.00	5,500.00	.....	660,715.00
Balance available at end of month	27,943.07	79,780.71	98,334.12	.....	661,600.56

[a] Improving harbor at Vicksburg, Miss., $442,724.77; Delta Point, La., $186,256.21.

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

FOURTH DISTRICT.

[Appropriations: Improving Mississippi River; improving harbor at Natchez and Vidalia, Miss. and La.; improving harbor of New Orleans, La.; improving Atchafalaya and Red rivers, Louisiana; emergencies in river and harbor works.]

	Improving Mississippi River, allotment for—				
	Surveys, gauges, and observations.	Lower Tensas levee district.	Atchafalaya levee district.	Lafourche levee district.	Barataria levee district.
Amount expended on present project to end of last fiscal year	$111,048.32	$2,728,263.09	$1,575,902.34	$637,191.47	$372,081.81
Balance unexpended at end of last fiscal year	1,088.82	254,785.85	39,207.32	54,292.45	27,651.06
Amount appropriated or allotted since (net)	[a] 10,002.78	535,000.50	55,000.00	.....	35,000.00
	11,091.60	789,786.35	94,207.32	54,292.45	62,651.06
Amount expended from beginning of present fiscal year to end of previous month	5,086.25	180,338.30	32,446.79	6,149.76	10,526.31
Amount expended during the month	10.00	599.61	288.05	160.13	272.65
	5,096.25	180,937.91	32,734.84	6,309.89	10,798.96
Balance unexpended at end of month	5,995.35	608,848.44	61,472.48	47,982.56	51,852.10
In Treasury United States	5,995.35	604,000.50	61,000.00	46,500.00	51,500.00
In hand	.....	4,847.94	472.48	1,482.56	352.10
	5,995.35	608,848.44	61,472.48	47,982.56	51,852.10
Outstanding liabilities at end of month	.....	116.81	1.00	10.25	7,575.00
Amount covered by existing contracts at end of month	.....	285,939.64	11,112.61	26,400.98	21,341.48
	.....	286,056.45	11,113.61	26,411.23	28,916.48
Balance available at end of month	5,995.35	322,791.99	50,358.87	21,571.33	22,935.62

[a] Amount previously reported increased during month $5,000. Allotments from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., p. 1243.)

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

FOURTH DISTRICT—continued.

	Improving Mississippi River, allotment for—				
	Pontchartrain levee district.	Lake Borgne levee district.	Bondurant.	Kempe Bend revetment.	Plant.
Amount expended on present project to end of last fiscal year	$1,465,288.63	$333,824.49	$38,000.00	$632,493.90	$376,132.68
Balance unexpended at end of last fiscal year	80,545.85	28,370.64	2,000.00	21,506.10	4,799.39
Amount appropriated or allotted since (net)	155,000.25	35,000.00	21,000.00	62,000.00	120,570.95
	235,546.10	63,370.64	23,000.00	83,506.10	125,370.34
Amount expended from beginning of present fiscal year to end of previous month	40,436.37	8,448.04	16,724.95	35,960.91	37,290.72
Amount expended during the month	789.02	4.80	.....	206.23	6,505.97
	41,225.39	8,452.84	16,724.95	36,167.14	43,796.69
Balance unexpended at end of month	194,320.71	54,917.80	6,275.05	47,338.96	81,573.65
In Treasury United States	190,500.25	51,000.00	5,000.00	43,000.00	81,573.65
In hand	3,820.46	3,917.80	1,275.05	4,338.96	.....
	194,320.71	54,917.80	6,275.05	47,338.96	81,573.65
Outstanding liabilities at end of month	3.34	7,578.34	1.17	1,232.31	9,026.11
Amount covered by existing contracts at end of month	64,147.76	25,968.47	.....	.....	.....
	64,151.10	33,546.81	1.17	1,232.31	9,026.11
Balance available at end of month	130,169.61	21,370.99	6,273.88	46,106.65	72,547.54

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

FOURTH DISTRICT—continued.

	Improving Mississippi River, allotment for—			
	Natchez and Vidalia harbors, Miss. and La.	New Orleans Harbor, La.	Atchafalaya and Red rivers, La.	Giles Bend.
Amount expended on present project to end of last fiscal year	$371,561.52	$146,024.19	$28,794.99	.....
Balance unexpended at end of last fiscal year	438.48	52,725.81	11,205.01	.....
Amount appropriated or allotted since (net)	[a] 150,002.10	[a] 110,000.50	8,666.42	[b] $75,000.00
	150,440.58	162,726.31	19,871.43	75,000.00
Amount expended from beginning of present fiscal year to end of previous month	42,920.42	61,833.97	6,563.15	.....
Amount expended during the month	236.83	674.87	.....	.....
	43,157.25	62,508.84	6,563.15	.....
Balance unexpended at end of month	107,283.33	100,217.47	13,308.28	75,000.00
In Treasury United States	105,001.50	100,000.25	13,166.42	75,000.00
In hand	2,281.83	217.22	141.86	.....
	107,283.33	100,217.47	13,308.28	75,000.00
Outstanding liabilities at end of month	563.46	205.12	67.70	.....
Amount covered by existing contracts at end of month	.....	.....	.....	.....
	563.46	205.12	67.70	.....
Balance available at end of month	106,719.87	100,012.35	13,240.58	75,000.00

[a] Amount previously reported increased during month $100,000. Allotments from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., p. 1243.)

[b] Allotment from appropriation by river and harbor act of March 2, 1907, by resolution of Mississippi River Commission, June 26, 1907. (Proc., p. 1243.)

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1907—Continued.

FOURTH DISTRICT—continued.

	Improving Mississippi River, allotment for—		Expended appropriations.	Grand total.
	Expended allotments.	Total.		
Amount expended on present project to end of last fiscal year	[a] $136,506.99	$8,953,114.42	[b] $2,303,601.30	$11,256,715.72
Balance unexpended at end of last fiscal year		578,616.78		578,616.78
Amount appropriated or allotted since (net)		1,372,243.50		1,372,243.50
		1,950,860.28		1,950,860.28
Amount expended from beginning of present fiscal year to end of previous month		484,725.94		484,725.94
Amount expended during the month		9,748.16		9,748.16
		494,474.10		494,474.10
Balance unexpended at end of month		1,456,386.18		1,456,386.18
In Treasury United States		1,434,671.70		1,434,671.70
In hand		21,714.48		21,714.48
		1,456,386.18		1,456,386.18
Outstanding liabilities at end of month		26,380.61		26,380.61
Amount covered by existing contracts at end of month		434,910.94		434,910.94
		461,291.55		461,291.55
Balance available at end of month		995,094.63		995,094.63

[a] Preservation of works, $134,000; dredges and dredging, $2,506.99.

[b] Improving harbor at Natchez and Vidalia, Mississippi and Louisiana, $282,252.04; improving harbor at New Orleans, La., $979,639.86; improving Atchafalaya and Red rivers, Louisiana, $1,001,709.40; emergencies in river and harbor works (Mississippi River at Giles Bend), $40,000.

LIST OF APPENDIXES ACCOMPANYING THE ANNUAL REPORT OF THE MISSISSIPPI RIVER COMMISSION FOR THE FISCAL YEAR ENDING JUNE 30, 1907.

Appendix 1.

Page.

Report of Capt. G. R. Lukesh, Corps of Engineers, U. S. Army, secretary Mississippi River Commission, on works under his charge (3 plates [a]) .. 2645

1 A.—Laws referring to works under the Mississippi River Commission, July 1, 1906, to June 30, 1907 2674

Appendix 2.

Report of Capt. Wm. D. Connor, Corps of Engineers, U. S. Army, on operations in first and second districts (15 plates [b]) 2675

Appendix 3.

Report of Capt. G. M. Hoffman, Corps of Engineers, U. S. Army, on operations in third district (15 plates [b]) 2701

Appendix 4.

Report of Capt. J. F. McIndoe, Corps of Engineers, U. S. Army, on operations in fourth district (12 plates [b]) 2729

APPENDIX 1.

REPORT OF CAPT. G. R. LUKESH, CORPS OF ENGINEERS, SECRETARY MISSISSIPPI RIVER COMMISSION.

MISSISSIPPI RIVER COMMISSION,
OFFICE OF THE SECRETARY,
St. Louis, Mo., May 31, 1907.

COLONEL: I have the honor to submit the following report of operations under this office for the year ending May 31, 1907.

The works in charge of the secretary of the Mississippi River Commission have been carried on under allotments made by the Commission from appropriations for improving the Mississippi River between the Head of the Passes and the mouth of the Ohio River, and under allotment for fiscal year from permanent appropriation provided by section 9 of the river and harbor act of June 13, 1902, for gauging the waters of the Mississippi River and its tributaries.

The allotments from the first-named appropriation are as follows:

(*1*) *Mississippi River Commission.*—Available for salaries, clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission.

(*2*) *Surveys, gauges, and observations.*—Available for survey of the Mississippi River between the Head of the Passes and its headwaters, for the establishment and maintenance of gauges, for special surveys and examinations, and for the collection and reduction of physical data pertaining to the Mississippi River, and for the maintenance and repair of plant.

(*3*) *Dredges and dredging.*—Available for the construction, operation, maintenance, and repair of dredging plant for the Mississippi River from Head of the Passes to the mouth of the Ohio River.

The allotment from the permanent appropriation for gauging is available for paying salaries of gauge observers and other expenses incident to maintaining gauges at specified places on the Mississippi River and its tributaries.

MISSISSIPPI RIVER COMMISSION.

The Mississippi River Commission held four sessions during the year, as follows:

Ninety-eighth session, June 18–19, 1906, at St. Louis, Mo.
Ninety-ninth session, August 27–28, 1906, at St. Louis, Mo.

---

[a] Plate 3 only is printed. [b] Not printed.

One hundredth and one hundred and first sessions on board the U. S. steamer *Mississippi*, St. Louis, Mo., to New Orleans, La., November 17–24, 1906, and March 17–23, 1907, respectively.

The proceedings of these sessions have been printed and issued. An index of the proceedings from 1896 to 1905, inclusive, was printed and bound with the proceedings of that period, forming volume 4.

The general resolutions of the Commission, as codified by a special committee and the secretary, were printed in a pamphlet of about 30 pages and issued.

The efficiencies of the hydraulic dredges were recomputed from the tests of 1902–3, using the corrected heads; the results have been printed and copies furnished to those to whom the report had been sent.

Plant and outfit.—The steamer *Mississippi* has been in service with the Commission on its inspection trips, and during the remainder of the time was laid up with the dredge fleet at West Memphis, Ark., until May 31, 1907, except when used by the Chief of Engineers, U. S. Army, for inspection purposes May 7 to 29. She left the fleet for the fall trip, 1906, on November 9, and returned December 6, 1906. She left for the spring trip, 1907, on March 10, and returned April 12, 1907. At the close of spring Commission trip and before returning to the fleet the steamer was used to convey certain members of the Rivers and Harbors Committee of the House of Representatives and other guests of the Louisiana delegation in Congress from New Orleans to the Atchafalaya River. She then returned to New Orleans, where she was docked. The two plates of her hull, injured when the steamer went aground at Helena during the Commission trip just completed, were in part renewed, and the entire hull below water line was scraped and coated with pitch. In addition to these repairs, while at the fleet, a defective sheet was cut out of the port boiler, and a new sheet riveted in its place, the breeching was repaired, the port engine was lined up, and numerous minor repairs were made to different parts of the machinery. The outside of the boat was sandpapered and painted, as was also the interior of the crew's quarters.

SURVEYS, GAUGES, AND OBSERVATIONS.

Survey of the Mississippi River.—This survey, which is authorized by the law creating the Mississippi River Commission, to extend from the Head of the Passes to the headwaters of the river, has been made with a view of obtaining accurate data for topographical and hydrographical maps for use in study of the river in connection with planning improvements. The field work has been conducted in accordance with the most approved methods. The instructions to field parties were printed in the reports of the Chief of Engineers for 1891, pages 3474–3485, and 1899, pages 3469–3474. The survey marks are intended to be permanent, in order that they may serve as the basis of future surveys to determine changes in the river. The field work, comprising secondary triangulation, precise levels, topography, and hydrography, has been completed over the entire river, a distance of about 2,347 miles. A summary of the survey to 1896 is printed in the Report of the Chief of Engineers for 1896, pages 3574–3576; the progress of the work since that date is given in detail in the successive annual reports.

Resurveys.—In order to ascertain what changes had occurred in the bed of the river since the first general survey, a resurvey of the river between its high-water banks was begun at the mouth of the Arkansas River in October, 1894, and carried to Vicksburg by December, 1894. This resurvey was continued from Vicksburg to Donaldsonville in 1895–96, and from Scott Bluffs to Carrollton in 1897–98. The results of the comparison between this resurvey and the earlier survey are printed in the Annual Reports of the Chief of Engineers for 1896, pages 3577–3598, and 1897, pages 3672–3686. A similar resurvey from the forts below New Orleans to the Head of the Passes was made in 1903–4, and the results are discussed in the Supplement to the Annual Report of the Chief of Engineers for 1905, pages 41–45. A similar resurvey was carried in 1902 from Cairo, Ill., to Corona Landing, Tenn. (203), and was completed to the mouth of the Arkansas River in 1904. The comparison of the two surveys of this stretch of river has not yet been made.

On account of certain observed discrepancies in the precise levels on the lower river, the line was rerun from Baton Rouge to the jetties in 1897–98, from Fort Adams (755) to Baton Rouge in 1900, and from Fort Adams to Vicksburg (600) in 1905–6. This releveling was continued northward during the past season to mouth of White River (393), and its further extension until the discrepancies between the earlier and latest lines disappear is contemplated.

WORK DONE DURING THE YEAR.

Precise levels.—The rerunning of precise levels along the Mississippi River, by a party under the charge of Asst. Engineer E. L. Harman, was begun opposite Vicksburg (600), where the work of the previous year had terminated, and was continued northward, ending at the close of the season at the mouth of White River, Arkansas (393). One hundred and eighty-two and eight-tenths miles of main line and 32.6 miles of side lines, a total of 215.4 miles, were run in duplicate; six river crossings were made. The results of this work and the descriptions of bench marks, which formerly have been a part of the report of this office, will, together with those of the preceding year, be printed at this office as soon as practicable. They are omitted from this report, as those of the preceding year were not printed in the report of the Chief of Engineers U. S. Army.

The cost of the field work was $6,409.97, or about $29.76 per mile of levels and $30.98 per mile of river.

Permanent marks.—Since the earlier surveys of the river below Cairo, a large number of permanent marks pertaining thereto have become lost or destroyed, due to caving banks or other causes. A party under Asst. Engineer A. T. Morrow, on the quarter boat *Illinois* and steamer *Mars* was put in the field last season to begin the restoration of the system. Work was begun at Cairo and suspended for that season at Barfield, Ark. (142). This work was continued this year, a party under Asst. Engineer Morrow beginning work on October 6, 1906, at Barfield (142) and closing for the season at a point about 5 miles above Helena, Ark. (302), on January 11, 1907. A system of tertiary triangulation and duplicate levels were carried down the river, and all marks, both old ones recovered and new ones set, were accurately located by triangulation and tape measurements. About 160 miles of river were covered, 103 old marks were recovered, and 96 new marks set. The total field cost was $8,308.73, or $51.93 per mile of river.

Reduction and platting of field notes.—The topographical notes have been reduced and platted from Pokegama Dam, Minnesota, to the vicinity of Lake Bemidji, survey of 1904.

The hydrographical notes have been reduced from near Aitkin, Minn., to Lake Winnibigoshish, and the soundings have been platted from Aitkin to Split Hand Creek, Minnesota, surveys of 1903 and 1904.

The reduction of notes of the survey for restoration of permanent marks from Cairo to Barfield, Ark., season of 1905, was completed. The reduction of notes of similar work, season of 1906, is about 70 per cent completed.

Mapping.—Detail charts Nos. 234 and 242, above Minneapolis, Minn., scale 1 : 5,000, were completed and are ready for the publisher. Charts Nos. 243 to 256, of the same series, have been partly drawn.

Maps Nos. 142 to 144, inch-to-the-mile series, were completed and are ready for the publisher. Map No. 145 of this series has been commenced.

New shore lines and other changes have been drawn on a copy of the inch-to-the-mile maps Nos. 1 to 25 for republication, also on index sheet No. 1 of the same series.

A copy of the lower alluvial map, in eight sheets, has been brought up to date for republication.

Published maps and charts.—No maps or charts were published by this office during the past year; sheets Nos. 1 to 12, 14, 18, and 20 of the inch-mile series were, however, corrected and republished, and arrangements have been made to republish Nos. 13, 15, 16, 17, 19, and 21 of the same series.

Maps and charts previously published by the Commission are as follows:

A map of the lower alluvial valley of the Mississippi River, from the vicinity of Cairo to the Gulf of Mexico, in eight sheets, scale 1 inch: 5 miles; first published in 1887 and republished, with additional data, in 1899.

Map of the valley of the Mississippi River from Cairo to St. Paul, in four sheets, scale 1 inch: 5 miles; published in 1899.

A district map of the Mississippi River from Cairo to the Gulf showing improvement and levee districts, in one sheet, scale 1 inch: 5 miles, was published in 1897.

Detail charts, 170 in number (scale 1:20,000), and with four index and two title sheets, showing hydrography of the river and topography of the territory near the river from the Gulf to Minneapolis, Minn., a distance of 1,957 miles.

Detail charts, 1:10,000, similar to the above, showing the river from Minneapolis, Minn., to the source of the Mississippi, are in process of compilation. Thirty-three sheets have been published, extending the series to 6.1 miles above Aitkin, Minn.

Maps of the Mississippi River on the scale of 1 inch: 1 mile, from the Gulf of Mexico to the lower limits of Brainerd, Minn., in seventy-three sheets, with index, title page, and cover, have been published. This series is being extended toward the source of the river.

Map of New Orleans and vicinity, in four sheets, showing Fort Chalmette, similar to the corresponding one of the detail charts described above, but on a scale of 1:10,000; also a map of Lake Itasca, in colors, on a scale of 1:15,000, in one sheet, and a map of the St. Francis Basin, scale one-half inch to 1 mile, in two sheets.

GAUGES.

A general description of the various gauges maintained under direction of this Office will be found on page 86 of supplement to the Report of the Chief of Engineers for 1905. No material changes have been made in the gauges during the year. The gauge at Barbre Landing, Louisiana, the only gauge of the Commission not now in charge of the secretary, will be transferred from the fourth district officer to the secretary at the end of the present fiscal year, under a recent resolution of the Commission.

The low-water inspection of all the regular gauges was made from November 1 to December 3, 1906. The errors found in the gauges were generally less than 0.2 foot, except at Red River Landing, Louisiana, and Bayou Sara, Louisiana, where settlement of the banks caused maximum errors of 1.3 feet and 1 foot, respectively, in the lower sections of the gauges. The high-water inspection of gauges is still in progress. All of the gauges have had the necessary repairs made and bulletins repainted at time of inspection. New steel bulletins of the latest type have been erected at St. Louis, Mo.; Mhoon Landing, Mississippi; Helena, Ark., and Bayou Sara, Louisiana.

The stages of the main river during the past year are chiefly remarkable, first, for the comparatively high stages during the usual low-water season, the lowest stage at Cairo, which was on November 16, 1906, being 11.9 feet, when the river began rising and reached 36.3 feet on November 27; the latter is the highest of record for November at this station since the establishment of the engineer gauge in 1871. The second remarkable occurrence was the first rise in 1907. This flood culminated at Cairo at 50.33 feet on the gauge on January 27. This is the highest stage of record for that month and lacks only 1.84 feet of the highest stage known at that station.

A second and moderate rise came in March, cresting at 46.17 feet on the Cairo gauge March 24, 1907. Both of these rises were observed on the high-water gauges from Cairo to Head of the Passes. The tabulated readings are given in Table No. 2 and the platted profile on plate No. 2[a] accompanying.

The highest and lowest readings of all the regular gauges on the Mississippi River and its tributaries for 1906 are given in Table No. 1.

The hydrographs of daily readings at all of these stations for 1906, in four sheets, are now being prepared.

The hydrographs of the Mississippi River from Cairo to Fort Jackson from June 1, 1906, to May 31, 1907, are given in plate 3, accompanying.

The comprehensive hydrograph of the Mississippi River and tributaries, first printed in the report of the Commission for 1900, has been corrected for earlier years at Little Rock, Ark., and is being brought up to date for republication in the report of the Commission for this year, plate 1.

The tide gauges at East Bay, Louisiana, and Biloxi, Miss., have been maintained. In the latter part of September last a severe tropical storm from the Gulf partly destroyed the gauge house at Biloxi and detached the float box. The storm was not so severe at East Bay, but a portion of the board walk leading to the gauge was destroyed. The damage at both stations was repaired promptly; the records at East Bay were not interrupted, but at Biloxi no record was obtained from September 27 to October 19. Arrangements have been made to drive piles for the gauge house at Biloxi to obviate jarring by the swing bridge. The reduction of the tide rolls has been brought up to June 20, 1905, for Biloxi and to August 26, 1906, for East Bay.

DISCHARGE OBSERVATIONS.

The January-February flood was measured on the main river at Columbus, Ky., Helena, Ark., Chicot, Ark., Vicksburg, Miss., Red River Landing and Carrollton, La., on the Atchafalaya River at Simmesport, La., on the Old River at the railroad bridge, and on the following tributaries: The Ohio River near

[a] Not printed.

Caseyville, Ky., the White River at Clarendon, Ark., and the Black River near Jonesville, La.

Four independent parties and outfits were required to make these observations, and these were organized under chiefs of party and boats as follows: Mr. E. L. Harman on the *Patrol*, Mr. E. J. Thomas on the *Search*, Mr. E. E. Whitehead on the *Mercury*, Mr. M. A. Bell on the *Mars*. The resources in the way of discharge instruments were severely taxed to outfit these parties, and it is the intention to obtain a further supply before the next season. By a close study of the telegraphic reports accurate predictions were made in advance of the flood, so that the measurements were obtained at the crest at all stations except at Columbus, Ky., where several days were lost after the arrival of the party on account of dense fog and running ice. All of the chiefs of the parties and many of their assistants were experienced in this work and displayed energy and zeal in its execution. The weather conditions at the upper stations were quite trying, and some damage to the meters was unavoidably caused by running ice and drift. One meter was lost by the party on the *Patrol* through the threads on supporting rod stripping off.

The observations at Clarendon were made by a party sent there by rail, and was in charge of Mr. Bell. The observations were made from a skiff hired for the purpose.

The second rise was measured only at Columbus, Ky., near the end of March. The party was on the steamer *Patrol* and in charge of Mr. W. W. Primm.

At the conclusion of the field work all of the meters were carefully rated by the various parties who had used them.

The computations of all the field notes of the season's work are now being made in the office.

The rivers did not fall to the stages prescribed for low-water discharge observations, and consequently none was made during the year.

The scientific records, maps, and construction drawings of the secretary's office have been catalogued and the indexes kept up. Various requests for information and data of the Mississippi River have been complied with.

The following assistants have been engaged in the office work of this division while not on field duty: Messrs. E. J. Thomas and George H. Wolbrecht, junior engineers, Mr. E. E. Whitehead, surveyor, and Messrs. F. E. Early and S. F. Pearsall, recorders.

This division has remained under the charge of Asst. Engineer Kivas Tully, from whose annual report much of the foregoing has been taken.

Plant.—The floating plant pertaining to this allotment consists of the steamer *Patrol* and the quarterboat *Illinois*, with a complement of skiffs. The small tender *Mars*, belonging to dredges and dredging, is commonly operated during the field season under this allotment, which also bears its share of the repairs to this boat. During the recent high water the steamers *Search* and *Mercury* have also been in service on discharge and gauge inspection work below Cairo. This plant when not in field service has been cared for at West Memphis. An additional boat specially planned for discharge and gauge inspection service is much needed.

Steamer Patrol.—This boat returned to the fleet from gauge inspections on June 3, 1906. She left on October 2 and was on service with precise level party until January 11, 1907, and from that date until March 17 with discharge party, when she returned to the fleet. She left again on March 20 on discharge and gauge inspection work, and is still in the field. While at the fleet repairs were made to the main deck nosing, cabin, wheel, and roof, and new stacks were made and erected.

Quarter boat Illinois.—This boat was in the field from October 1, 1906, to January 14, 1907. While at the fleet the rakes of the hull were entirely rebuilt and the arrangement of the cabin has been changed by building some additional bulkheads.

DREDGES AND DREDGING.

Project.—On the 20th of June, 1896, the Mississippi River Commission adopted a project for obtaining and maintaining, by means of dredges, a channel in the Mississippi River below Cairo, with a width of 250 feet and a depth of at least 9 feet throughout the year, except when the river is closed by ice. This project provided for the construction and operation of seven hydraulic dredges by the 30th of June, 1900, and for the provisional construction of two others, if found necessary. In June, 1902, the first dredge having become unserviceable, the construction of a tenth dredge was decided upon. This dredge, which will

embody all desirable features of the older dredges, as well as certain new features believed to be desirable, was placed under contract April 25, 1905, and its construction is now in progress.

The building of this plant has formed a very important part of the work of this office, and has involved the preparation of plans and specifications for the dredges themselves, for the necessary large and small tenders, pile sinkers and other plant. The progress of this work has been described in detail in previous annual reports.

CONSTRUCTION, ALTERATION, AND REPAIRS OF PLANT.

New dredge.—On April 25, 1905, contract was entered into with The Springfield Boiler and Manufacturing Company, of Springfield, Ill., for the construction of the new dredge to be named *B. M. Harrod*. By the terms of the contract, the dredge was required to be ready for delivery by December 7, 1906, but owing to delays in the delivery of material, due in part to a strike in the pipe mills of the Reading Steel Company, the time limit was waived.

This dredge, with its ponton pipe line, is now completed with the exception of sundry small details, and it is expected that the contractor will submit the vessel for final inspection preparatory to making the builder's test at Grafton, Ill., where she has been built, within a week or two. The boilers have been under steam and some of the machinery has been in operation, though not under working conditions. The smokestacks can not be finished until the dredge arrives in the lower river, owing to the lack of clearance of the bridges at St. Louis. The Government test will take place in the vicinity of Memphis, Tenn.

The other plant pertaining to this allotment, comprises the following pieces:

Dredges.—*Beta, Gamma, Delta, Epsilon, Zeta, Iota, Kappa,* and *Henry Flad.*

Steamboats.—*Sachem, Choctaw, Leota, Nokomis, Wynoka, Minnetonka, Search, Venus, Vulcan, Mercury,* and *Mars.*

Pile sinkers.—*Nos. 971, 981, 982, 983,* and *984.*

Barges.—*Nos. 041* and *051.*

Miscellaneous.—Pump boat, two calking flats, 6-part sectional dock, and a number of skiffs.

This plant, together with the steamers *Mississippi* and *Patrol* and the quarter boat *Illinois*, was cared for at West Memphis, Ark., when not in the field, and such repairs and alterations as were required to keep it in good condition and increase its efficiency were made.

The small tenders *Venus, Vulcan,* and *Mercury* have been used at different times as fleet tenders during the lay-up season. Dredge *Beta*, in tow of the steamer *Leota*, left the fleet on June 20, 1906, for Louisville, Ky., where the *Beta* was docked and her hull sand blasted and painted. This work was completed in July and the tow returned to the fleet on August 1, 1906. Steamer *Nokomis* left the fleet on December 20, 1906, for Caruthersville to move the coal fleet to West Memphis, Ark. She returned to the fleet with 10 full barges of coal on December 23, 1906. During the period of extreme high water, January 30 to February 7, 1907, the steamers *Sachem, Nokomis,* and *Venus* were held under steam in order to be in readiness to render assistance in maintaining levees and for rescue work. The *Sachem* was used under instructions from Capt. William D. Connor, Corps of Engineers, U. S. Army, first and second districts officer, to tow a barge of sand from the fleet of the first and second districts to Holleybush, Ark., where the levee was threatened. The *Nokomis* was also used under direction of Captain Connor as a dispatch boat for visiting threatened points on the levee and for other service. Dredge *Gamma*, with pile sinker *No. 984*, 1,000 feet of pontons, and three barges partly loaded with coal, in tow of the steamer *Leota*, left the fleet April 6, 1907, for the Arkansas River, where she is at work under the direction of Captain Connor. The dredge *Iota* left the fleet in tow of the steamer *Choctaw* on May 1, 1907, for Keokuk, Iowa, and is now in the Government dock at that place having her hull cleaned and painted. Fourteen barges, containing 213,591 bushels of coal, were delivered at Caruthersville, Mo., by the West Kentucky Coal Company, on June 24, 1906, and were cared for there until December 22, 1906, except four barges, which had been previously delivered at various times to dredges operating above that point. On December 22, 1906, the remaining 10 barges were taken in tow by the steamer *Nokomis* and landed at the dredge fleet at West Memphis, Ark., the following day. This coal was cared for at the fleet during the remainder of the period. On May 1, 1906, there was on hand at the dredge fleet 254,658 bushels of coal left over from the previous year, on account of the small amount of dredging required. Seventy-six thousand eight hundred and

twenty-three bushels of this amount was transferred to the engineer officer in charge of the first and second districts of the Mississippi River, and the balance was expended in dredging operations and at the steam plant at the fleet.

All employees were furnished subsistence in kind. During the year 62,479 rations were served, at a cost of $0.48397 each, including the wages of cooks, waiters, and all necessary labor in caring for quarters. The more important of the repairs made at the fleet are given in detail in the following paragraphs taken largely from the annual report of Asst. Engineer F. H. Hilliard, superintendent of dredging operations.

Dredge Beta.—The painting of this boat was completed. Minor repairs were made to the cabin, smokestacks, and roof.

Dredge Gamma.—The roof was repaired and painted. The pontons were cleaned and painted with gas-house pitch. The air chambers were turned over in the yokes in order that the badly pitted undersides might be above the water surface. The construction of the new smokestacks was begun.

Dredge Delta.—Minor repairs were made to the boiler and main decks. Two new chocks and a kevel were fitted onto the stern of the lower deck. The new spud was shaped and placed in the well. The bathroom and water-closet for laborers and firemen were removed from the lower deck to the after end of the boiler deck. The journal boxes of the main pump shaft were bored out. The nosing around the main deck was renewed. The high-pressure piston rod of the main engine was straightened. The cabin was painted inside and out. The peripheral liners of the main pump were renewed. Repairs to the port main winding engine were commenced. Several sections of the ponton discharge pipe were sand blasted and painted.

Dredge Epsilon.—The installation of the condenser and feed water heater, with the necessary changes in piping, was completed. The cabin was painted inside and out. The foundations under the capstan engines were renewed. A slight bag, which an examination of the boilers disclosed, was set up.

Dredge Zeta.—This boat was painted inside and out. A new safety valve was fitted to the boilers. Some bolts and screws were made for the low-pressure cylinders of the main engines. The piston of the jet engine was turned up.

Dredge Iota.—Some changes were made in the boiler feed pipe and the heater was repaired. The cabin was painted inside and out. The home section of the ponton discharge pipe line was lowered to facilitate coupling to the pipe at the stern of the dredge. A new governor pin was made and fitted in the wheel of the port main engine. Minor repairs were made to the machinery and to the ice plant. The parts of the electric-light engine which had been wrecked by the breaking of a crosshead bolt were renewed and this plant put in good working order. The after stairways leading from the main to the boiler deck were renewed. Extensive repairs were made to the wheelhouses.

Dredge Kappa.—The home section of the ponton discharge pipe line was lowered to facilitate coupling to the pipe at the stern of the dredge. Some repairs were made to the floating discharge pipe. A new crank was made and fitted to the shaft of the ice machine. The liners of the main pump were patched. A new crosshead pin was made and fitted to the ice machine, the crosshead brasses were machined, and other repairs made. Some rivets were cut out of the main suction pipe in the hold and new rivets driven. The main exhaust pipe was taken down for the purpose of reriveting the seams. The foundation of one of the capstan engines was renewed. New peripheral liners were fitted in the casing of the main pump. Minor repairs were made to the ponton discharge pipe. The interior of the cabin was painted.

Dredge Henry Flad.—The new stacks, work on which was commenced last year, were completed and erected. New packing rings were made for the jet pump. The lining of the main pump casing was patched. The home section of the ponton discharge pipe line was lowered to facilitate coupling to the pipe at the stern of the dredge, and minor repairs were made to the pontons and discharge pipe. Some new valves were placed in the auxiliary steam line. The interior of the cabin was painted. The wooden foundations under the capstans were renewed.

Steamer Sachem.—Some repairs were made to the fantail nosing and stationary fenders. The wooden foundations under the capstans were renewed. Some repairs were made to the ice plant and the electric-light engines.

Steamer Choctaw.—The main throttle valve was repaired and ground. Some stationary fenders were renewed. Expansion joints were fitted in the side pipes of the starboard engine. The electric-light plant of this boat was moved temporarily to the dredge *Iota*.

Steamer Leota.—Minor repairs were made to the machinery and other parts. A slight bag in the middle boiler of the starboard battery was set up. The wooden foundations under the capstan engines were renewed.

Steamer Nokomis.—Minor repairs were made to the machinery, boilers, and exhaust pipes. The pilot house and roof were repaired.

Steamer Wynoka.—New exhaust nozzles were made and fitted in the stacks. Minor repairs were made to the machinery, heaters, and decks.

Steamer Minnetonka.—The repairs to the heater and exhaust pipes were completed. New signboards were made for the pilot house.

Steamer Search.—Repairs were made to the main engines and to the electric lighting plant. The cabin was painted inside and out. The bilge siphons were removed from the center line of the boat to either side alternately. Parts of the exhaust pipe were renewed. The steam pipe to the electric-light engine was increased from a 1-inch to a 1¼-inch.

Steamer Venus.—The main engines and feed pump were repaired. The main deck guards and nosing were repaired.

Steamer Vulcan.—The engines and doctor were repaired. Extensive repairs were made to the woodwork of the cabin. The cabin was painted inside and out. A large pump was installed on this boat for fire protection at the fleet. A saddle was made for the lifeboat on the roof.

Steamer Mercury.—The main engines and feed pump were repaired. Extensive repairs were made to the main deck and nosing. The cabin was painted inside and out. A stationary fender was erected. One rudder was taken out and the stock straightened.

Steamer Mars.—The main engines were lined up and the piston rods turned. New packing rings were made for the main engines, and the pistons were turned. The cabin was painted inside and out. Extensive repairs were made to the main deck nosing.

Pile sinkers Nos. 981, 982, 983, and 984.—The jet pumps were repaired and foundations under the hoisting engines renewed in part. *No. 981* was used to furnish steam for the sand-blast outfit, and *No. 983* was used for pumping out the dock to raise pontons.

Pump boat.—A new piston was made for the boiler feed pump. Some repairs were made to the large fire pump.

Docks.—Some kingbolts were made and holes drilled in the straps to receive them. Some iron piles were fitted with straps and used for logs for connecting the different sections of the dock, used in raising pontons. Four sections of the dock were repaired and calked.

Buildings and grounds.—The coal chute to the boiler house on shore was rebuilt. The suction pipe leading from the artesian well to the pump house was overhauled and piping and fittings renewed where necessary. A woodworking shop was built and the machinery installed. An old engine, formerly used for driving the cutter machinery of the dredge *Delta*, was overhauled and fitted up to drive the woodworking machinery. A new circular saw and planer were installed, and the old band saw and lathe were moved from the old carpenter shop into the new shop.

A part of the land belonging to the Government is being used as a garden to furnish vegetables for use in subsisting employees.

Tools and appliances.—The rebuilding of the derrick used in transferring stores from the boats to the bank was completed. A number of special wrenches, blacksmith, and machine tools were made and repaired. Some screw clamps were made for carpenter work. The bilge siphons were repaired. A large number of ice cans were made to replace those rusted out; also some fire tools and chisels. A hopper for drying sand in connection with the sand-blast outfit was fitted up. All tools were properly cared for and repaired as occasion demanded.

The maintenance of all parts of machinery, piping, and woodwork in a good condition involves an amount of work greatly in excess of that involved in those repairs specifically noted. Some of the principal items of general repairs are:

All pipes in the holds of the steamboats and dredges were examined with hammers, and unserviceable pipe and fittings renewed. All nipples, gauges, water columns, and Snowden heaters were disconnected from boilers and examined, renewals being made where necessary. Nearly all furnaces have required more or less repairs. A large amount of sheet iron repairs were made. Flange bolts were taken out, run down, and oiled. The holds were cleaned and painted where necessary. All roofs were repaired and painted. The smokestacks of the dredges and large steamboats were scraped inside and out, and

were oiled inside with black oil and painted outside. Smaller stacks were painted outside. All paddle wheels have been repaired as required and decayed wood in cabins has been renewed. At the close of the dredging season all machinery and pipes were drained and bright surfaces oiled. All auxiliary machinery, water supply, sanitary and heating systems, and the refrigerating plants were carefully overhauled. This work is necessary each year to maintain the plant in an effective working condition and prevent deterioration.

DREDGING OPERATIONS ON THE LOWER MISSISSIPPI RIVER, BETWEEN CAIRO, ILL., AND THE HEAD OF THE PASSES.

A statement of the general principles which have governed the conduct of dredging operations may be found in the Report of the Chief of Engineers, U. S. Army, for 1898, pages 3166–3169, and in the Report of the Chief of Engineers for 1900, page 4564.

During the low-water season of 1906 five dredges, the *Delta*, the *Epsilon*, the *Iota*, the *Kappa*, and the *Henry Flad*, were in commission and operated on various bars from Point Pleasant (82) to Presidents Island (235). Three survey parties were in the field, and surveys were made of all bars where trouble was expected. These surveys served to determine the areas of shoal water and to enable the channels to be intelligently located. Surveys were also made of those bars where dredging was done to observe the effect of the dredging. Frequent inspections were made of that part of the river where shoals are known to exist, and all crossings sounded. Information was given to pilots and others interested in the navigation of the river, and buoys and other marks showing the location of the channel were placed where required.

The river stages during the low-water season are shown on the annual hygrograph plate 3. It will be noticed that an unusually high rise set in about the middle of November, reaching 36.3 feet on the Cairo gauge November 27 and 29.2 feet on the Memphis gauge November 30. No dredging was required after this rise, as the lowest subsequent stage was 19.7 feet at Cairo on December 10 and 13.3 feet at Memphis on December 14. The lowest stage of the season was on November 16, when the Cairo gauge read 11.9 feet and the Memphis gauge read 6.55 feet.

A considerable amount of dredging was required on several bars during this low-water season, notwithstanding the fact that the river at no time reached a very low stage. A succession of rises partially filled the channels, produced by the earlier dredging operations, and rendered a repetition of the work necessary on the subsidence of the river to a comparatively low stage.

On August 5, when the Cairo gauge showed 17½ feet, with the river falling quite rapidly, a trip of inspection of the river between Nolans Crossing (76) and Memphis, Tenn., was made, and shoal crossings sounded. The least depth was found at Linda (83) where there was only 12 feet on August 6, with the Cairo gauge reading 17.4 and the New Madrid gauge 14.3. As the river was falling at the rate of about two-tenths of a foot a day, and there was no rise in sight, the indications were that dredging would be needed at Linda by the time a dredge could be gotten ready and towed to this locality from the dredge fleet.

At Fritz a least depth of 12 feet was found down the shore by Fritz Landing (102), and there was probably less than a foot more of water than this in the crossing. Corona Crossing (203) was the only other bar on which dredging would be required by a slight fall in the stage. Since it requires about five or six days to raise steam and tow a dredge from Memphis to Linda and Fritz, preparations were immediately commenced to start the *Delta* for Linda, and the *Iota* for Fritz. On account of its short distance from Memphis, it was not necessary to prepare a dredge for work at Corona until a considerably lower stage of water had been reached or the indications of a continued fall were more pronounced.

When the *Delta* arrived at Linda August 15, and the *Iota* at Fritz August 20, rains had occurred in the Ohio Valley and the river at Cairo had begun to rise. The rise which followed in the lower river rendered dredging unnecessary at any point until September 20, when dredging was commenced simultaneously on Linda and Fritz crossings by the *Delta* and *Iota*.

LINDA CROSSING (82).

A comprehensive survey made of Linda Crossing September 18 showed the bottom of the river one foot and a half above zero on the local gauge, which had been set to correspond with the gauge at New Madrid, or a depth of 12

feet in a narrow and crooked channel. Steamboats, however, had difficulty in finding 10½ feet. The shoal was due to a large flat lump in the middle of the river. In order to form a channel with any kind of alignment, it was necessary to cut through the center of this lump, and the *Delta* was placed on the bar to carry out this plan. One cut 1,230 feet long had been made through this lump with great difficulty, as the material proved to be a stiff, blue mud, when the large driving wheel of the port winding engine broke. This accident completely disabled the dredge, and it was necessary to suspend operations and move the dredge out of the channel for repairs. Since heavy rains were reported in the Ohio, Cumberland, and Tennessee valleys at the time, and the river was falling very slowly, no attempt was made to immediately replace the *Delta* with another dredge from the fleet. It was finally found impracticable to make the necessary repairs to the *Delta's* winding machinery before the close of the low-water season, and this dredge was therefore moved to the dredge fleet at West Memphis, leaving Linda Landing on October 7 and arriving at the fleet on the 9th.

On October 20, when it became evident that dredging would again be required at Linda Crossing, the *Iota* was moved from Fritz Landing to this point, and dredging was commenced on October 21. The work contemplated was completed on the 26th. The *Iota* was placed on the crossing again on November 3 to widen out the lower end of the dredged channel. This work was completed on November 6 and the dredge was tied up at Linda Landing to await a lower stage. A comparison of the maps of September 18, made just before dredging by the *Delta*, and November 14, made after dredging by the *Iota*, shows that the channel had moved downstream parallel with itself a distance of about 800 feet during the rapid rise and fall which occurred between these dates. In the lower position no mud was encountered and there was no difficulty in maintaining a channel of the required dimensions. This map of November 14 also indicates that there was a strong tendency of the current to break away from the dredged cut entirely at the upper end of the improved channel and make for the bank about one-half mile below the Linda light, and there is little doubt that this would have taken place had the stage continued low a short time longer. Notwithstanding this fact the dredging axis and cuts were properly selected. The experience at Corona, where nearly the same conditions existed, except that the odds were much more in favor of the lower channel, and where an unsuccessful attempt was made to assist the river in breaking through the lower way, indicates that in all cases it is the most economical procedure to improve the best channel that exists without attempting to force the trend of the river prematurely. If conditions arise later which compel the water to seek another channel, this does not necessarily mean that a mistake was made in the first location, but it does mean that a careful watch should be kept on all side channels as well as on the first selected for improvement, in order that a useless waste of time and energy may be avoided in attempting to hold a position which is no longer tenable.

FRITZ CROSSING (101).

The map of Fritz Crossing, made from the survey of September 14, showed three distinct channels—one down the shore by Burnleys, one (which was used by steamboats) from light on Island 14 to light on Tennessee shore about 1 mile below Fritz Landing, and the one which was selected for improvement under a bold reef above Fritz Landing. Experience had proved that it was almost impossible to maintain a good channel through a bar that joins the shore. The lower shoal was long and flat with chances against the possibility of maintaining a sufficient depth through the entire extent. The work of the *Iota* at Fritz in the middle crossing was satisfactory and a good channel with least depth of 13 feet was produced.

The sharp rise which followed dredging by the *Iota* practically filled up the dredged channel, and when it became evident that a stage would be reached which would require dredging on this crossing a second time the *Epsilon* was started from the fleet in tow of the steamer *Nokomis*. She arrived at Fritz Landing November 1.

On November 9, when the Cottonwood Point gauge had reached a stage slightly below 8 feet and there was but 10 feet in Fritz Crossing, the *Epsilon* was placed at work in the shoal part of the crossing to reopen the channel formerly dredged by the *Iota*. On the 19th a satisfactory channel had been secured and the dredge was moved to the bank to await a lower stage. A rise

following close on the completion of the work rendered further dredging at this point unnecessary.

CORONA CROSSING (203).

On September 23 a rise had begun to show on the gauge at Cairo, and the evidence at hand indicated that this rise would maintain a good boating stage in the lower river well into October, without the aid of the dredges. Thus far, up to September 25, it had not been necessary to place more than two dredges in the field, but on this date soundings at Corona Crossing developed only 10 feet in the channel, and although a considerable rise was in sight, it was feared that the channel might shoal to less than 9 feet before the rise reached Corona. The dredge *Henry Flad* was therefore sent to this crossing and placed at work on September 27.

The location of the dredging axis as shown on the map made from the survey of September 23 was determined in a great measure by the direction and velocity of the current and the fact that a rise would follow close on the completion of dredging, the effect of a rise being almost invariably to shift the channel downstream. On account of this consideration, therefore, this location was chosen for dredging operations, rather than the one above Corona Landing, where the natural channel was a little deeper, but the velocity of the current much less. Dredging was continued in this crossing until the river commenced to rise rapidly on September 29.

The lowest point reached by the Memphis gauge at this time was 7.8 feet, on September 25. The crest of the rise which followed passed Memphis on October 11, when a stage of about 18.6 feet was reached. The fall was then rapid until the end of the month, when the gauge reading at Memphis was about 8 feet.

On October 22 it was found very difficult to find a depth of 12 feet through Corona Crossing, there being only 10½ feet steamboat water. The dredge *Henry Flad* was moved out on the crossing and made an excellent channel. This work was completed on October 27, and no further work was required on this crossing.

NEW HAVEN CROSSING (163).

The bar abreast of New Haven had for some time been building in toward the shore, and early in November had rendered the channel at this point very narrow. On November 14, therefore, the *Henry Flad* was started from Corona for New Haven, with pontons and coal barge in tow, and arrived at that point on the 16th, when dredging was commenced. Only a few cuts were necessary to widen the channel at this place, and the work was completed on the 17th. No further dredging at this point was required, as the river commenced to rise rapidly soon after the completion of the work.

PRESIDENTS ISLAND CROSSING (235).

The bar in Presidents Island Crossing changes very little from year to year, and the stage of the Memphis gauge, which causes a depth of 9 feet in the crossing, is well established and is about 3.0 feet. Since the material in the crossing is gravel, which is very difficult to remove either by dredging or current erosion, it is necessary to commence operations at a much higher stage than this, or at least 7 feet on the Memphis gauge.

On November 11, when the Memphis gauge read 7½ feet, the *Kappa* was sent from the fleet at West Memphis to cut a channel through the crossing which would give 9 feet at mean low water.

The *Kappa* continued dredging until noon November 20, when unprecedented local rainfalls caused all small streams between Cairo and Memphis to run out with enormous volume. This caused a sharp rise in the Mississippi River at Memphis and rendered further dredging impossible. The object in continuing dredging at this point as long as possible was to obtain a channel which would be of the required dimensions at mean low water.

An examination of the maps of this crossing, made in the past three years, shows that the channels obtained have withstood the eliminating effects of high water. It is hoped that the work done at this bar by the dredge *Kappa* this year will prove of permanent benefit and lessen the amount of dredging necessary when extreme low water may prevail. There were no bars below Presidents Island which required dredging during the low-water season of 1908.

Dredge Delta.—This dredge left the fleet at West Memphis at 3 p. m. on August 10 and arrived at Linda at 4.30 p. m., August 15, where she lay at the bank until 12.15 p. m. September 20, awaiting a stage that would require dredging on Linda Crossing. Work on the lower end of this crossing was commenced at this time and continued until 1.40 a. m. September 23, when the main driving gear of the drum of the port hauling engine broke, rendering a suspension of operations necessary. The breaking of this wheel is attributed to the heavy strain required on the cable to force the suction head into the stiff mud encountered in this locality. After work had been suspended, a crack was discovered in one of the cast elbows which connect the jet pipe with the suction head. This was repaired by banding.

For handling material of this character it is recommended that one of the dredges be equipped with cutters and walking spuds. Jets make no impression whatever on material of this character, and it is necessary to force the suction head through it by means of winding engines, subjecting engines and cables to excessive strains.

Since it was found the broken gear wheel could not be repaired and a new wheel could not be procured within several months, this dredge was ordered to the fleet at West Memphis. She left Linda in tow of the steamer *Sachem* at 8 a. m. on October 7 and arrived at the fleet at 2 p. m. on the 8th.

Dredge Epsilon.—This dredge left the fleet at West Memphis at 10.45 a. m. on the morning of October 28 and arrived at Fritz at 5 p. m. November 1. At 9 a. m. on November 9 the dredge was moved from the bank, and dredging was commenced on Fritz Crossing at 2.20 p. m. The work projected was completed at 9.30 a. m. November 19, when the dredge was moved to the bank to await a lower stage or deterioration of the channel. No further work was required, and the dredge left Fritz Landing at 9.45 a. m. December 15 and arrived at the fleet at 2.30 p. m. on the 17th.

Dredge Iota.—This dredge left the fleet at West Memphis at 6.30 a. m. August 14 and arrived at Fritz Landing at 6.20 a. m. on the 20th. She lay at the bank at this point awaiting a lower stage of water until September 20, when she was moved out on Fritz Crossing and dredging commenced. At 4 p. m. September 23 a satisfactory channel had been opened through the bar, and the dredge was again tied up to the bank, where she remained until 6.15 a. m. on October 20. On this latter date the dredge was ordered to Linda Landing and arrived at that point at 9 a. m. on October 21. Dredging was commenced on Linda Crossing at 1.30 p. m. the same day and continued until 8 p. m. on the 26th, when the work projected had been completed. The dredge was then moved to the bank and tied up to await a lower stage or a filling in of the channel. She was moved out on the crossing again on November 3 and commenced dredging at 12 noon. The work on this crossing was completed at 9.40 a. m. November 6, and the dredge was tied up at Linda to await a lower stage.

The electric-light engine was completely wrecked by the shearing of the two crosshead bolts while running at full speed. The plant from the steamer *Choctaw* was installed on the *Iota*, pending the procuring of a new engine.

The dredge was moved out on the crossing again November 18 to make a few cuts through the lower end. The work was completed the following day and the dredge was moved to the bank. No further work was required of this dredge, and at 11 a. m. December 18, she left the bank at Linda, and started for the dredge fleet at West Memphis, arriving there at 10.15 a. m. December 20.

Dredge Kappa.—This dredge left the fleet at West Memphis at 9 a. m. November 11, and commenced dredging in Presidents Island Crossing at 9 a. m. on the 12th, after great difficulty had been experienced in sinking the mooring piles in the gravel. Work was continued until noon on November 20, when, on account of the rapid rise of the river, further dredging was rendered both unnecessary and impracticable.

After cooling down the boilers, a crack was discovered in the third sheet in the outside boiler of the starboard battery. A patch was riveted on in order that the dredge might be in condition for service during the balance of the season. No further service was required of this dredge, however, and she returned to the fleet at 10 a. m. December 12.

Dredge Henry Flad.—This dredge left the fleet at 8.35 a. m. September 25, with pontons and loaded coal barge in tow, and arrived at Corona at 9.45 a. m., September 26. The plant was placed and dredging commenced at 8.25 a. m. on

the 27th. Work was continued until 1.50 p. m. on the 28th, when a rise in the river rendered further dredging unnecessary. She was then moved to the bank, opposite Corona, and tied up to await a lower stage.

This dredge was again moved out on Corona Crossing on October 22, and dredging was commenced a second time at 2.25 p. m. on this date. The work projected was completed on the 27th at 1.50 p. m., and the dredge was again moved to the bank and tied up at 9 a. m.

On November 14 this dredge started for Luxora, and arrived at 7.25 a. m. on the 16th. Work on this bar was commenced at 9 a. m. on this date and completed at 9.25 a. m. on the 17th. No further work was required of this dredge and she returned to the fleet at West Memphis December 15.

Channels not less than 10 feet in depth and of widths exceeding 250 feet were maintained through all bars during the year. This work has been in charge of Asst. Engineer F. H. Hilliard, superintendent of dredging, from whose annual report the foregoing has been largely taken.

Based upon the usual suppositions that the width of each cut is the width of the suction mouth of dredge and that the side slopes of the channel are 1 on 2½, the amount of material moved by the dredges during the season was 297,300 cubic yards. In 1905 this yardage was 197,847; in 1904, 2,149,734; in 1903, 891,098; in 1902, 813,380; in 1901, 1,666,465; in 1900, 1,145,558, and in 1899, 1,612,223.

A statement of the cost of dredging operations from May 1, 1906, to April 30, 1907, is given in Table No. 3, and the depths over shoal crossings during the low-water season, as found by the inspection party of the *Search*, are given in Table No. 4.

SURVEY FOR 14-FOOT WATERWAY, MISSISSIPPI RIVER, FROM THE MOUTH OF THE ILLINOIS RIVER TO ST. LOUIS, MO.

No work was done under this appropriation during the year.

The following papers accompany this report:

Money statements.

Abstract of contracts in force.

Commercial statistics.

Statement of charts issued and sold.

Appendix 1 A. Laws affecting the Mississippi River Commission, July 1, 1906, to June 30, 1907.

Table 1. Highest and lowest gauge readings in 1906, Mississippi River and tributaries.

Table 2. High-water gauge readings, Mississippi River, 1907.

Table 3. Cost of dredging operations, May 1, 1906, to April 30, 1907.

Table 4. Depths over shoal crossings, Mississippi River, low-water season of 1906.

Plate 1.[a] Comprehensive hydrograph, Mississippi River and tributaries, to June 1, 1907.

Plate 2.[a] Profile of the Mississippi River from Cairo to Head of the Passes during high water of 1907.

Plate 3. Hydrograph of Mississippi River, Cairo, Ill., to Fort Jackson, La., June 1, 1906, to May 31, 1907.

Respectfully submitted.

G. R. LUKESH,
Captain, Corps of Engineers,
Secretary Mississippi River Commission.

Col. CLINTON B. SEARS,
President Mississippi River Commission.

---

[a] Not printed.

MONEY STATEMENTS.

Appropriation for improving Mississippi River.

July 1, 1906, balance unexpended		$292,735.47
Amount allotted from appropriation by sundry civil act approved June 30, 1906	$302,000.00	
Amount allotted from appropriation by river and harbor act approved March 2, 1907	324,000.00	
Miscellaneous receipts as follows:		
Amount received as reimbursement for engineer property sold to International Waterways Commission under the provisions of section 5 of river and harbor act of June 13, 1902. Credited to allotment for "Mississippi River Commission" in December, 1906	292.75	
Amount transferred from allotment for "Lower St. Francis levee district" as reimbursement for expenses of steamer *Nokomis* in protection of levees in January and February, 1907. Credited to allotment for "Dredges and dredging" in April, 1907	499.08	
Amounts transferred from allotments in charge of first and second districts officer in payment for purchases of coal. Credited to allotment for "Dredges and dredging" in the months named:		
August, 1906	1,496.58	
October, 1906	1,060.29	
November, 1906	1,930.20	
June, 1907	1,794.92	
Amount received in April, 1907, from sale of blueprints. Credited to allotment for "Surveys, gauges, and observations" in May, 1907	5.42	
		633,079.24
		925,814.71
June 30, 1907, amount expended during fiscal year		394,260.10
July 1, 1907, balance unexpended		531,554.61
July 1, 1907, outstanding liabilities	23,774.45	
July 1, 1907, amount covered by uncompleted contracts	79,909.64	
		103,684.09
July 1, 1907, balance available		427,870.52

Appropriation for gauging waters of the Mississippi River and its tributaries.[a]

July 1, 1906, balance unexpended		$2,742.63
Amount allotted by Chief of Engineers, July 2, 1906, from permanent indefinite appropriation made by section 6 of river and harbor act of August 11, 1888, as amended by section 9 of river and harbor act of June 13, 1902		9,100.00
		11,842.63
June 30, 1907, amount expended during fiscal year	$7,189.00	
June 30, 1907, amount reverted to Treasury during fiscal year	1,753.11	
		8,942.11

[a] The custody and care of the gauges maintained under this appropriation were assumed by the Mississippi River Commission February 11, 1901, on which date they were transferred to the secretary, under authority of Secretary of War, dated January 25, 1901.

July 1, 1907, balance unexpended	$2,900.52
July 1, 1907, outstanding liabilities	2,057.34
July 1, 1907, balance reverting to Treasury	843.18
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907	9,100.00

Itemized statement of expenditures during the fiscal year ending June 30, 1907, submitted in compliance with requirement of section 6 of river and harbor act of August 11, 1888.

Observations:		
Pay of permanent gauge observers		$3,600.00
Inspections and repairs:		
Inspection of gauges on Mississippi River by junior engineers and parties on steamers	$1,714.82	
Inspection of gauges on tributaries	139.68	
Renewals and repairs of gauges and bulletins	99.95	
		1,954.45
Office expenses and contingencies:		
Pay of assistant and junior engineers, recorders, and clerks	1,484.02	
Stationery, printing, etc	150.53	
		1,634.55
		7,189.00

CONSOLIDATED STATEMENT OF APPROPRIATIONS EXPENDED UNDER THE SECRETARY, MISSISSIPPI RIVER COMMISSION, TO JUNE 30, 1907.

Appropriation for gauging waters of the Mississippi River and its tributaries

Allotments from general appropriations for examinations, surveys, and contingencies of rivers and harbors by acts of—	
March 3, 1871	$5,000.00
June 10, 1872	5,000.00
March 3, 1873	5,000.00
June 23, 1874	5,000.00
March 3, 1875	5,000.00
Specific appropriations by river and harbor acts of—	
August 14, 1876	5,000.00
June 18, 1878	5,000.00
March 3, 1879	5,000.00
June 14, 1880	5,000.00
March 3, 1881	5,000.00
August 2, 1882	5,000.00
Deficiency act of March 12, 1884	2,100.00
Specific appropriations by river and harbor acts of—	
July 5, 1884	5,000.00
August 5, 1886	5,000.00
Allotted from specific appropriation by river and harbor act of August 11, 1888	8,700.00
Deficiency act of October 19, 1888	3,600.00
Allotments from permanent indefinite appropriation made by section 6 of river and harbor act of August 11, 1888, for fiscal years, viz:	
1890	9,000.00
1891 (less $3,518.34 withheld in United States Treasury under ruling that only $6,000.00 can be expended each fiscal year)	5,181.66
1892	5,100.00
1893	5,500.00
1894	5,500.00
1895	5,500.00
1896	5,500.00
1897	5,500.00
1898	5,500.00
1899	6,000.00
1900	5,500.00
1901	6,000.00
1902	6,000.00

Allotments from permanent indefinite appropriation made by section 6 of river and harbor act of August 11, 1888, as amended by section 9 of river and harbor act of June 13, 1902, for fiscal years, viz:

1903	$9,100.00
1904	9,100.00
1905	9,100.00
1906	9,100.00
1907	9,100.00
Total	200,681.66

EXPENDED.

	To June 30, 1906.	During year ending June 30, 1907.	Total.
Expenditures	$179,757.22	$7,189.00	$186,946.22
Unexpended balances reverted to Treasury	9,081.81	1,753.11	10,834.92
Total	188,839.03	8,942.11	197,781.14
Unexpended balance June 30, 1907			2,900.52
Total appropriated, etc.			200,681.66

Appropriation for waterway from Lockport, Ill., to St. Louis, Mo.

Act of June 13, 1902 (river and harbor)	$25,000.00
Amount transferred from allotment for "Survey of Illinois and Des Plaines Rivers, Illinois," as reimbursement	1,093.40
Total	26,093.40

EXPENDED.

	To June 30, 1906.	During year ending June 30, 1907.	Total.
Expenditures	$22,291.23		$22,291.23
Unexpended balance reverting to Treasury			[a]3,802.17
Total appropriated, etc.			26,093.40

[a] Less $6.50 outstanding liabilities (unclaimed wages).

Abstract of contracts in force June 30, 1907—Improving Mississippi River, Mississippi River Commission, secretary's office.

Contractor.	Amount and character of work.	Price.	Date of contract.	Date of approval.	Date of beginning work.	Date of expiration.
The Springfield Boiler and Manufacturing Co.	Constructing self-propelling hydraulic dredge and ponton pipe line.	$238,998.17	1905. Apr. 21	June 15, 1905	1905. June 19	1906.[a] Dec. 7
The Monongahela River Consolidated Coal and Coke Co.	Furnishing 300,000 bushels coal, per bushel.	.11¼	1907. May 1	June 4, 1907	1907. June 7	1908. June 30
Charles H. Organ	Water front privileges, per annum.	150.00	June 19	Emergency contract.	July 1	Do.
Matthew C. Williams.	do	100.00	do	do	do	Do.
Humphrey Fullerton.	Lease of office rooms, per annum.	4,272.00	June 18	do	do	Do.

[a] Time stipulation for completion of contract waived for a reasonable period.

COMMERCIAL STATISTICS FOR CALENDAR YEAR 1906.

TABLE No. 1.

Tonnage between—	Number of passengers.	Receipts and shipments in tons.					
		Grain and its products.	Cotton.	Cotton seed and its products.	Live stock.	Coal and coke.	Lumber.
St. Louis and Cairo	48,357	28,858	1,177	673	11,542	170,830	10,765
Cairo and Memphis	68,920	4,551	10,903	13,288	.....	1,030,000	254,156
Memphis and Vicksburg	117,109	33,000	64,906	60,525	3,236	842,513	462,486
Vicksburg and New Orleans	79,004	24,298	53,269	25,224	3,358	832,410	67,720

Tonnage between—	Receipts and shipments in tons.					
	Logs.	Iron, steel, and metals.	Groceries and provisions.	Stone, sand, and gravel.	Miscellaneous and unclassified.	Total.
St. Louis and Cairo	120,113	325	7,779	37,800	68,154	458,016
Cairo and Memphis	238,464	58,449	762	21,300	88,020	1,719,893
Memphis and Vicksburg	288,250	35,898	32,507	491,458	41,122	2,355,901
Vicksburg and New Orleans	184,591	29,928	77,839	858,572	397,127	[a] 2,554,336

[a] Includes 303,159 tons of oil.

NOTE.—Each stretch is treated as a separate river, and tonnage carried between ports on different stretches will appear in the statistics of all intervening stretches. Consequently the sum of the tonnage carried in the four stretches does not represent the total traffic on the river as a whole.

TABLE No. 2.—*Receipts and shipments at principal ports.*

Port.	Passengers carried in and out of port.	Receipts and shipments in tons.					
		Grain and its products.	Cotton.	Cotton seed and its products.	Live stock.	Coal and coke.	Lumber.
St. Louis, Mo	[a] 550,223	32,617	1,392	673	23,432	170,530	10,765
Memphis, Tenn	92,473	8,932	25,392	15,838	1,504	199,945	10,708
Vicksburg, Miss.[b]	61,875	35,133	45,302	49,128	731	75,807	14,320
New Orleans, La.[c]	24,132	854,951	553,378	305,164	7,772	864,453	592,186

Port.	Receipts and shipments in tons.					
	Logs.	Iron, steel, and metals.	Groceries and provisions.	Stone, sand, and gravel.	Miscellaneous and unclassified.	Total.
St. Louis, Mo	87,797	1,120	33,533	.....	121,822	483,681
Memphis, Tenn	85,185	589	9,087	462,158	65,863	885,201
Vicksburg, Miss.[b]	52,500	91	13,273	17,000	15,891	319,176
New Orleans, La.[c]	366,872	43,677	895,521	150,000	[d] 1,068,522	5,702,496

[a] Includes 440,860 passengers in local excursion traffic.
[b] The traffic with the Yazoo River and its tributaries not included.
[c] Includes exports and imports and the domestic coastwise traffic as far as reported.
[d] Includes 439,527 tons of oil.

TABLE No. 3.—*Seagoing traffic at New Orleans, La.*

Arrivals and departures.	Number.	Tonnage.
Foreign-bound vessels	2,313	4,162,654
Coastwise vessels	918	1,500,665
Total	3,231	5,663,319

Receipts and shipments:	Tons.
Grain and its products	833, 853
Cotton	517, 092
Cotton seed and its products	290, 239
Live stock	5, 435
Coal and coke	25, 593
Lumber	566, 919
Logs	219, 781
Iron, steel, and metals	35, 246
Groceries and provisions	814, 986
Oils	121, 826
Miscellaneous and unclassified	605, 624
Total	4, 036, 594

TABLE No. 4.—*Ferry traffic.*

Location of ferries and transfers.	Number of passengers.	Tonnage of freight carried.					
		Grain and its products.	Cotton.	Cotton-seed and its products.	Live stock.	Coal and coke.	Lumber.
At St. Louis, Mo	1,777,550	784,410	50,260	312	10,310	1,555,486	267,134
At Chester, Ill.; Cape Girardeau, Mo.; Commerce, Mo., and Thebes, Ill	110,662	14,081	.....	.....	58,000	11,600	300
At Cairo, Ill., to Birds Point, Mo.; Wickliffe, Ky.; and Greenfield, Mo., Belmont, Mo., to Columbus, Ky	126,313	35,030	.....	724	1,457	7,633	115,227
At New Madrid, Mo.; Cottonwood Point, Mo., and Hales Point, Tenn	897	74	100	12	1,083	.....	55
At Memphis, Tenn., to Hopefield, and West Memphis, Ark.	220,042	78,300	43,477	22,125	6,060	30,020	50,720
At Helena, Ark.; Arkansas City, Ark., and Ashport, Tenn	65,460	5,265	5,188	4,336	184	13,643	21,589
At Vicksburg, Miss., and Delta Point, La	83,283	7,878	66	30	404	50,593	6,246
At Natchez, Miss.; Bayou Sara, La., Baton Rouge, La., and Donaldsonville, La	289,886	16,915	8,616	.....	2,207	30,141	3,783
At New Orleans, La	3,688,363	438,167	198,211	175,903	50,911	76,891	360,435

Location of ferries and transfers.	Tonnage of freight carried.					
	Logs.	Iron, steel, and metals.	Groceries and provisions.	Sand, gravel, and stone.	Miscellaneous and unclassified.	Totals.
At St. Louis, Mo	.....	227,426	.....	1,153,750	3,229,928	7,279,016
At Chester, Ill.; Cape Girardeau, Mo.; Commerce, Mo., and Thebes, Ill	.....	100	1,150	3,600	5,410	94,241
At Cairo, Ill., to Birds Point, Mo.; Wickliffe, Ky.; and Greenfield, Mo., Belmont, Mo., to Columbus, Ky	4,016	1,005	16,111	.....	413,201	594,404
At New Madrid, Mo.; Cottonwood Point, Mo., and Hales Point, Tenn	.....	.....	27	.....	167	1,518
At Memphis, Tenn., to Hopefield, and West Memphis, Ark.	31,550	45,755	91,400	.....	[a]44,755	449,162
At Helena, Ark.; Arkansas City, Ark., and Ashport, Tenn	3,799	91	17,076	.....	1,885	73,056
At Vicksburg, Miss., and Delta Point, La	.....	24,176	1,110	.....	404,851	495,354
At Natchez, Miss.; Bayou Sara, La.; Baton Rouge, La., and Donaldson, La	726	.....	825	.....	24,108	87,321
At New Orleans, La	.....	111,048	186,567	.....	2,786,411	4,384,544

[a] Does not include 44,000 empty cars transferred.

Statement of charts and maps issued and sold from July 1, 1906, to June 30, 1907—Improving Mississippi River, Mississippi River Commission, secretary's office.

Description.	Free.	Sold.	Total.
Upper alluvial valley map	141	20	161
Lower alluvial valley map			
Inch-to-mile map	1,962	1,092	3,054
Detail chart, 1:20,000 scale	1,828	470	2,298
Detail chart, 1:10,000 scale	225	48	273
Detail chart, 1:10,000 scale (harbor of New Orleans)	12	12	24
District map of lower Mississippi River	14	7	21
Lake Itasca Basin	15	9	24
St. Francis Basin	12	16	28
Total	4,209	1,674	5,883

Proceeds deposited with the assistant treasurer of the United States at St. Louis, Mo., $212.36.

TABLE No. 1.—*Highest and lowest gauge readings of 1906.*

MISSISSIPPI RIVER.

Station.	Distance from Cairo.	Elevation of gauge zero above Cairo datum plane.	Elevation of gauge zero above mean Gulf level.	Highest. Prior to 1906. Date.	Highest. Prior to 1906. Gauge reading.	Highest. 1906. Date.	Highest. 1906. Gauge reading.	Highest. Difference compared with previous highest.	Lowest. Prior to 1906. Date.	Lowest. Prior to 1906. Gauge reading.	Lowest. 1906. Date.	Lowest. 1906. Gauge reading.	Lowest. Difference compared with previous lowest.
	Miles above.	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Aitkin, Minn	1,090	1,206.78	.....	July 6–8, 1905	16.36	Apr. 26	14.85	− 1.51	July 29, 1902	1.3	Aug. 21	2.20	+ 0.9
St. Paul, Minn	874	704.57	.....	Apr. 29, 1881	19.7	June 12	13.3	− 6.4	Mar. 19, 20, 22, 1896.	− .9	Oct. 22, 23 Nov. 25	5.0	+ 5.9
Hastings, Minn	849	690.79	.....	Apr. 30, 1881	18	June 12, 13	13.5	− 4.5	Nov. 23, 1892	− .70	Jan. 1, 20, 21 Feb. 16–19	4.8	+ 5.5
Winona, Minn	760	660.34	.....	June 18, 1880	16.87	Apr. 19, 20	13.3	− 3.57	Dec. 30, 1889	−1.33	Dec. 12	4.1	+ 5.43
Prairie du Chien, Wis	668	625.59	.....	June 22, 1880	21.30	Apr. 22, 23	15.4	− 5.90	1864	− .2	Oct. 23–26	5.0	+ 5.2
Rock Island, Ill	510.7	562.37	.....	June 27, 1892	19.4	Apr. 22–26	13.90	− 5.5	Jan. 5, 6, 1890	− .9	Dec. 20	1.90	+ 2.80
Burlington, Iowa	427.6	531.25	.....	May 18, 19, 1888 June 30, 1892	17.6	Apr. 24–26	12.30	− 5.3	Dec. 4, 5, 1895	−1.1	Dec. 22	1.70	+ 2.80
Nashville, Iowa	393.6	516.86	.....	May 17, 18, 1888	12	Apr. 26–28	7.90	− 4.1	Jan. 7, 1890	− .5	Dec. 24	.40	+ .90
Hannibal, Mo	329.4	469.60	.....	June 8, 1903	22.5	Apr. 25–29	15.2	− 7.3	Jan. 9, 1890	−1.75	Dec. 26	1.0	+ 2.75
Grafton, Ill	233	424.09	.....	June 11, 1903	28.7	Apr. 15	18.3	−10.4	Dec. 9, 1895	− .9	Dec. 28	4.4	+ 5.3
Alton, Ill	216.2	333.974	.....	June 9, 1903	115.80	Apr. 14	103.10	−12.7	Dec. 19, 1897 Jan. 28, 29, 1902	82.70	do	86.0	+ 3.30
St. Louis, Mo	190.8	400.22	.....	June 10, 1903	[a] 38	Apr. 15	26.20	−11.8	Jan. 2, 1900	−2.52	do	3.0	+ 5.52
Chester, Ill	115.5	361.30	.....	June 13, 14, 1903	33.3	Apr. 1, 16	22.7	−10.6	Jan. 3, 1900	−4.1	Dec. 29	2.6	+ 6.7
Grand Tower, Ill	85	342.17	.....	.....	.....	Apr. 1	25.5	.....	.....	.....	do	7.2	.....
Cape Girardeau, Mo	54.5	324.97	.....	June 14, 1903	36.53	Apr. 2	27.6	− 8.93	Feb. 1, 1902	.8	do	7.3	.....
Grays Point, Mo. [b]	48	321.28	.....	June 14, 15, 1903	35.40	do	27.70	− 7.7	Dec. 31, 1880	.95	do	7.1	.....
	Below.												
Cairo, Ill	0	290.84	.....	Feb. 27, 1883	52.17	Apr. 9	46.90	− 5.27	Dec. 24, 1871	−1.0	Nov. 16	11.90	.....
Columbus, Ky	21.6	286.76	.....	Feb. 26, 1883	45.58	Apr. 10	42.39	− 3.19	Nov. 6–8, 1895	.05	do	12.0	.....
Morrisson Landing, Mo. [c]	69	275.80	.....	Feb. 24, 1884	41.50	.....	.....	.....	Nov. 11–14, 1879	− .17	.....	.....	.....
New Madrid, Mo	70.3	[d] 275.72	.....	Mar. 29, 1897	40.27	Apr. 11	37.04	− 3.23	Nov. 6–8, 1895	.55	Nov. 17	10.10	+ 9.55
Cottonwood Point, Mo	122.5	[e] 250.67	.....	Mar. 19, 1903	39.96	Apr. 12, 13	36.7	− 3.26	Nov. 5–8, 1895	−3.35	Nov. 16	7.1	+10.45
Fulton, Tenn	175.4	228.55	.....	do	40.15	Apr. 15	35.30	− 4.85	Nov. 7, 8, 1895	.16	Nov. 13, 14, 16	7.35	+ 7.19
Memphis, Tenn	230.0	203.97	.....	Mar. 20, 1903	40.1	Apr. 15	37.07	−3.03	Nov. 6–9, 1895	−2.65	Nov. 14–16	6.55	+ 9.2
Mhoon Landing, Miss	276.3	181.48	.....	Mar. 25, 1903	41.81	Apr. 16–18	39.3	−2.51	Nov. 6–11, 1895	−7.8	Nov. 14	5.1	+12.9
Helena, Ark	306.5	161.98	.....	Apr. 4, 1897	51.75	Apr. 19	47.05	−4.7	Nov. 8, 9, 1895	−3.0	Nov. 16	9.82	+12.82
Sunflower Landing, Miss	352.7	147.08	.....	Mar. 27, 28, 1903	48.0	Apr. 20	45.2	− 2.8	Nov. 12–14, 1895	−1.5	do	11.0	+12.5
Mouth White River, Ark	393.2	128.73	.....	Mar. 28, 29, 1903	53.7	Apr. 21	49.8	−3.9	Dec. 28, 1872	.0	Nov. 17	14.2	+14.2

Arkansas City, Ark	428.3	116.44	.....	Mar. 27, 28, 1903	52.9	Apr. 22	50.0	−2.9	Nov. 9, 10, 1895	−3.6	.....do	12.1	+15.7
Greenville, Miss	478.3	108.00	.....	Mar. 27, 1903	49.1	Apr. 23, 24	44.9	−4.2	Nov. 10, 11, 1895	−2.55	.....do	9.45	+12.0
Lake Providence, La	542.3	89.62	.....	.....do	46.48	.....do	43.7	−2.78	Nov. 17, 1896	−5.3	.....do	7.65	+12.95
Vicksburg, Miss	599.3	.....	46.16	Apr. 16, 1897	52.48	Apr. 26	47.15	−5.33	Nov. 13, 14, 1895	−6.5	.....do	9.1	+15.6
St. Joseph, La	648.3	.....	33.15	Mar. 28, 1903	48.07	Apr. 29	43.75	−4.32	Nov. 13, 1895	−9.3	.....do	5.75	+15.05
Natchez, Miss	700.3	.....	17.09	Mar. 28–30, 1903 Apr. 2, 1903	50.35	Apr. 29, 30	46.7	−3.65	Nov. 13–15, 1895	− .85	Nov. 19	11.6	+12.45
Red River Landing, La	765.3	.....	3.57	May 14, 15, 1897	50.2	May 1	44.7	−5.5	Nov. 14, 1895	− .6	Nov. 20	10.9	+11.5
Bayou Sara, La	799.8	.....	4.15	May 13–15, 1897	43.7	Apr. 30–May 3	37.4	−6.3	Nov. 16, 1895	−2.8	.....do	6.3	+ 9.1
Baton Rouge, La	833.3	.....	− .42	.....do	40.65	May 1–4	34.4	−6.25	Nov. 14, 1894	.45	Nov. 16, 17	7.2	+ 6.75
Plaquemine, La	854.1	.....	.44	May 13–17, 1897	36.25	.....do	30.5	−5.75	.....do	− .94	Nov. 16, 17, 21	5.15	+ 6.09
Donaldsonville, La	885.4	.....	−1.01	May 13, 1897	32.75	May 2, 3	27.4	−5.35	Nov. 11, 1894	1.0	Nov. 15, 16	5.4	+ 4.40
College Point, La	904.5	.....	.29	May 15, 1897	27.95	May 1, 4	23.15	−4.8	Nov. 14, 1894	− .91	Nov. 21	3.05	+ 3.96
Carrollton, La	957.0	.....	− .13	Mar. 29, 1903 Apr. 5, 6, 1903	19.42	May 4	16.0	−3.42	Dec. 27, 1872	−1.6	Nov. 15	2.05	+ 3.65
Algiers, La	966.0	.....	−2.64	Mar. 25, 26, 29, 1903	19.9	May 3	17.0	−2.9	Dec. 20, 28, 1904	2.0	.....do	4.4	+ 2.4
Fort Jackson, La	1,039.0	.....	−1.68	Mar. 27, 1903	8.05	Apr. 30 May 8, 10, 12	7.1	− .95	Nov. 12, 14, 1894 Dec. 7, 1893	.3	Nov. 21, 22	2.3	+ 2.0

[a] High water of June 28, 1844, would read 41.4 feet.
[b] Gauge transferred to Cape Girardeau in 1896.
[c] Gauge transferred to New Madrid in 1893.
[d] 276.19 feet by ordinary levels of 1905.
[e] 250.57 feet by ordinary levels of 1905.

TABLE NO. 1.—*Highest and lowest gauge readings of 1906*—Continued.

TRIBUTARIES OF MISSISSIPPI RIVER AND THE ATCHAFALAYA.

River.	Station.	Approximate distance of station from—	Elevat'n of gauge zero above Cairo datum plane.	Elevat'n of gauge zero above mean Gulf level.	Highest. Prior to 1906. Date.	Highest. Prior to 1906. Gauge reading.	Highest. 1906. Date.	Highest. 1906. Gauge reading.	Highest. Difference compared with previous highest.	Lowest. Prior to 1906. Date.	Lowest. Prior to 1906. Gauge reading.	Lowest. 1906. Date.	Lowest. 1906. Gauge reading.	Lowest. Difference compared with previous lowest.
		Miles.	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Arkansas	Little Rock, Ark	Mouth 176	241.53	.....	May 21, 1892.	31.20	May 5	21.90	− 9.30	Oct. 23, 24, 1879	1.8	Nov. 16	4.35	+ 2.55
Arkansas[a]	Pine Bluff, Ark	Mouth 110	200.34	.....	May 22, 1892.	30.50	.....	.....	.....	Nov. 20–23, 1887	−0.40	.....	.....	.....
Atchafalaya	Barbre Landing La.	Head 0	.....	3.88	May 13, 14, '97	50.95	May 3, 4, 7	43.30	− 7.65	Oct. 26, 1897	−1.77	Nov. 18–20	8.80	+10.57
Atchafalaya[b]	Simmesport, La	Head 4	.....	5.79	May —, 1897.	47.32	May 3–5	39.5	− 7.82	Nov. 8, 1891	−3.5	Nov. 17, 19	6.5	+10.0
Atchafalaya	Melville, La	Head 31	.....	.44	Apr. 4, 5, 1903	38.7	May 4	36.0	− 2.7	Nov. 12, 13, 1894	1.0	Nov. 17–21	11.0	+10.0
Cumberland	Nashville, Tenn	Cairo 244	334.8	.....	Jan. 22, 1882.	55.30	Apr. 3	34.4	−20.90	Oct. 15, 16, 1878	−0.40	July 12	7.75	+ 8.15
Illinois	Peoria, Ill	Mouth 160	448.95	.....	Mar. 28, 29, '04	23.00	Mar. 7–12	15.9	− 7.1	Oct. 7, 1890	2.6	July 18–22. 24–28.	6.8	+ 4.2
Illinois[a]	Beardstown, Ill	Mouth 86	444.29	.....	1882	21.3	.....	.....	.....	Aug. 11, 12, 1887	0.60	.....	.....	.....
Missouri	Kansas City, Mo	Mouth 388	737.44	.....	June 1, 2, '03.	[c]35.0	June 21	19.7	−15.3	Dec. 2, 1874[d]	1.5	Dec. 26	2.3	+ 0.8
Missouri[a]	Coles Creek, Mo	Mouth 107	433.97	.....	May 15, 1892.	96.76	.....	.....	.....	Dec. 24, 1897	70.7	.....	.....	.....
Missouri	Hermann, Mo	Mouth 103	502.17	.....	June 6, 1903.	[e]29.5	Mar. 29	16.6	−12.9	Dec. 21, 22, 1878	−0.75	Dec. 29, 30.	4.8	+ 5.55
Ohio	Cincinnati, Ohio	Mouth 504	449.44	.....	Feb. 14, 1884.	71.06	Apr. 2	50.2	−20.86	Sept. 18, 1881	1.92	Sept. 17, 22	7.0	+ 5.08
Do	Louisv'le (upper), Ky	Mouth 364	419.76	.....	Feb. 16, 1884	46.60	Apr. 3	26.1	−20.50	Sept. 10–14, 18–22, '81 ..... Nov. 14–16, 1895	1.70	Sept. 20	3.1	+ 1.4
Do	Louisv'le (lower), Ky	Mouth 364	392.85	.....	do	72.00	do	51.8	−20.20	Oct. 17, 18, 1872	1.60	Sept. 19, 20	6.0	+ 4.4
Do	Evansville, Ind	Mouth 183	349.3	.....	Feb. 19, 1884.	48.8	Apr. 6	41.1	− 7.7	Nov. 7, 8, 1895	−0.3	Sept. 21	5.1	+ 5.4
Do	Paducah, Ky	Mouth 45	300.46	.....	Feb. 23, 1884.	54.25	Apr. 8	40.5	−13.75	Oct. 30–Nov. 4, 1895	−0.7	Nov. 17	5.3	+ 6.0
Do	Cairo, Ill	Mouth 1	290.84	.....	Feb. 27, 1883.	52.17	Apr. 9	46.90	− 5.27	Dec. 24, 1871	−1.00	Nov. 16	11.90	+12.90
Ouachita	Camden, Ark	Mo. Red Riv 325	.....	71.10	May 12, 1882.	46.0	Jan. 27, May 8	35.20	−10.8	Aug. 29, 30, 1887	1.80	Nov. 17	4.00	+ 3.20
Do	Monroe, La	Mo. Red Riv 175	.....	30.97	1874	49.1	Feb. 9, 10	35.0	−14.1	Sep.–Nov. '97, '99, '01	0.0	Nov. 16–18	2.0	+ 2.0
Red	Fulton, Ark	Mouth 508	.....	224.48	July 17, 1876.	35.75	May 10	30.95	− 4.8	Oct. 20–22, 1896	0.10	Nov. 16	8.15	+ 8.05
Red[a]	Garland, Ark	Mouth 450	.....	203.16	Mar. 24, 1894.	28.50	.....	.....	.....	Sept. 22–25, 1896	−0.20	.....	.....	.....
Red	Shreveport, La	Mouth 320	.....	140.99	May 28, 1892.	35.70	Jan. 2, 3	22.6	−13.1	Dec. 2–4, 1894	−5.5	Nov. 17, 19	0.4	+ 5.90
Do	Alexandria, La	Mouth 110	.....	44.18	Jun. 12, 13, '92	38.25	Jan. 5	29.65	− 8.6	Sept. 29, 1881	−3.7	Nov. 19	2.90	+ 6.6
St. Francis	Bridge St. Louis, Iron Mt. and So. Ry.	Mouth 194	.....	.....	Apr. 4–6, 1897	41.6	Apr. 22	25.7	−15.9	Nov. 3–11, 1901	−0.05	Aug. 9–11	2.2	+ 2.25
St. Francis[a]	Wittsburg, Ark	Mouth 180	.....	.....	Apr. 28, 1886.	42.02	.....	.....	.....	Oct. 27–31, Nov. 10–14, 1892	−3.60	.....	.....	.....
Tennessee	Chattanooga, Tenn	Cairo 495	651.90	.....	Mar. 11, 1867.	58.6	Nov. 22	33.3	−25.3	Sept. 11–14, 1881, and Nov. 19, 1883.	0.00	June 12, 13	3.2	+ 3.2
Do	Florence, Ala	Cairo 300	418.04	.....	Mar. 19, 1897.	32.20	Nov. 25	16.70	−15.5	Oct. '72, Sept. 18, '78	−0.76	May 25	1.50	+ 2.26
Do	Johnsonville, Tenn	Cairo 139	343.3	.....	1882	48.0	Oct. 9	25.3	−22.7	Oct. 26–Nov. 4, 1904	−0.9	June 17	3.2	+ 4.1
Wabash	Mount Carmel, Ill	Cairo 190	397.86	.....	Aug. 7, 1875.	28.3	Apr. 8	23.6	− 4.7	Nov. 7–23, 1895	−0.2	Aug. 6–11	0.8	+ 1.0
White	Jacksonport, Ark	Mouth 360	.....	.....	Mar. 14, 1890.	33.35	Mar. 29	31.30	− 2.05	Dec. 24, 1872	−1.10	Aug. 8	2.37	+ 3.47
Do	Clarendon, Ark	Mouth 134	158.9	.....	Mar. 20, 1890.	36.63	Apr. 6	33.05	− 3.58	Nov. 22, 1887	4.07	Aug. 10	9.90	+ 5.83
Yazoo	Yazoo City, Miss	Mouth 65	.....	73.54	1882	36.50	Apr. 27	22.6	−13.9	1875	−4.30	Sept. 24	−1.24	+ 3.06

[a] Discontinued. [b] Record from May, 1892, to Dec., 1905, in part only. [c] H. W. of June, 1844—37.0 feet. [d] January 6 gauge read −0.1; probably affected by ice.
[e] H. W. of June, 1844, would read 35.6 feet.

TABLE No. 2.—*Maximum heights above Memphis datum at high-water and regular gauges on the Mississippi River from Cairo to the Passes during the flood of 1907, with high water of 1903 for comparison—Second rise of 1907 in separate column.*

Designation of gauges.	Distance from Cairo.	Highest water, 1907.		Highest of 1903.	Difference between 1903 and highest of 1907.	Method of obtaining 1907 highest reading.[a]	Second rise of 1907, March-April.	
		Date.	Elevation above Memphis datum.				Elevation above Memphis datum.	Method.[a]
	Miles.		*Feet.*	*Feet.*	*Feet.*		*Feet.*	
Cairo	0	Jan. 27	328.0	328.3	−0.3		323.9	
182	4.4	do	326.5	326.2	+0.3		322.8	
181	10.0	do	325.8				322.1	
180	12.5	do	323.7	323.7	0.0		320.3	
179	17.8	do	320.9	320.8	+0.1		318.2	
Columbus	21.3	do	318.2	318.1	+0.1		315.6	
178	27.5	Jan. 29	316.5	316.2	+0.3		313.6	
177	33.5	Jan. 28, 29	314.5	314.0	+0.5		312.2	
176	38.5	Jan. 28	311.9	311.6	+0.3		309.4	
175	44.3	Jan. 27, 28	309.7	309.4	+0.3		307.4	
174	49.8	Jan. 28	307.4	307.4	0.0		305.4	
173	54.0	Jan. 27, 28	306.6	306.0	+0.6	Stain	304.4	Stain.
172	59.5	Jan. 28	305.9	306.0	−0.1		303.1	
171	64.5	do	303.9				301.0	Do.
New Madrid	70.3	Jan. 29	301.9	302.1	−0.2		298.5	
170	73.3	Feb. 1	300.4				296.2	Do.
169	78.9		297.2	297.5	−0.3	Stain	294.1	Do.
168	84.8	Jan. 28	294.4	295.6	−1.2		291.2	
167	89.5	Jan. 29, 30	291.1	292.3	−1.2		288.2	
166	95.0		288.2	289.4	−1.2		285.3	
165	99.3		286.8	287.8	−1.0		284.0	
164	104.1	Jan. 30, 31	285.0	286.2	−1.2	Stain	281.7	Do.
163	109.3	Jan. 30	282.2	283.4	−1.2		278.8	
162	113.5		280.0	281.4	−1.4		277.0	
161	118.5	Jan. 30, 31	277.4	279.1	−1.8		274.4	
Cottonwood Point	123.0	Jan. 31	276.0	277.6	−1.6		273.1	
160	127.4	do	274.6	276.3	−1.8		272.2	Do.
159	130.5		273.1				270.1	
158	135.0		272.0	273.7	−1.7		269.6	
157	140.0	Jan. 30	270.0	271.8	−1.8		266.4	
156	146.0	Feb. 1	266.5				262.6	
155	152.8	do	263.2	265.1	−1.9		259.2	
154	158.3	Feb. 1, 2	260.8	262.6	−1.8		256.6	
153	161.8	do	259.8	261.6	−1.8		255.3	
152	167.5		258.1				253.1	Do.
151	172.8	Feb. 2	255.7				249.8	
Fulton	175.4	Feb. 2	253.8	255.6	−1.8		249.0	
150	180.1		252.1	253.9	−1.8		246.8	
149	186.3	Feb. 2	248.9	250.4	−1.5		244.8	
148	192.6		247.6	247.8	−0.2		242.2	
147	197.3	Feb. 2	246.1	246.8	−0.7		240.9	
146	203.3		243.0	243.8	−0.8	Stain	238.4	Do.
145	208.0	Feb. 2	241.7			do	236.4	Do.
144	212.8	do	239.1			do	234.2	Do.
143	220.4	do	237.4	236.7	+0.7		232.7	
142	225.5	do	233.7	232.7	+1.0		229.0	
Memphis	230.0	Feb. 3	231.1	231.0	+0.1		226.3	
141	235.0	Feb. 5, 6	228.2	228.4	−0.2		223.8	
140	239.5	do	226.7	225.6	+1.1		221.7	
139	243.5	do	225.0	224.4	+0.6	Stain	220.0	Do.
138	249.5	do	221.8	221.6	+0.2		217.0	
137	256.3	do	218.2	217.5	+0.7		213.4	
136	261.3	do	215.2	215.0	+0.2		210.5	
135	266.8	do	213.2	213.2	0.0		209.2	
134	271.0	do	211.9	211.0	+0.9		207.4	
Mhoon Landing	276.3	do	210.6	210.2	+0.4		206.2	
133	280.5	Feb. 5	209.3	209.2	+0.1		205.2	
132	284.3	do	206.4	206.6	−0.2	Stain	202.2	Do.
131	289.5	Feb. 4, 5	204.9	205.6	−0.7		200.1	
130	293.5	do	203.1	204.0	−0.9		197.8	
129	297.8	Feb. 7	202.7	203.7	−1.0		197.2	
128	301.5	Feb. 6	202.0	202.0	0.0		196.6	
Helena	306.5	do	199.2	199.8	−0.6		194.1	
127	312.5	Feb. 5, 6	198.7	197.2	+1.5	Stain	193.6	Do.
126	317.8	do	195.3	195.3	0.0		190.3	
125	323.5	Feb. 7	193.4	193.2	+0.2		188.3	
124	329.3	Feb. 5	191.3	191.2	+0.1		186.1	
123	334.5	Feb. 6	189.8	189.5	+0.3		185.0	
122	339.0	do	187.5	186.6	+0.9		182.8	
121	342.5		185.7	185.5	+0.2	Stain	180.9	
120	346.8	Feb. 6	183.5	184.0	−0.5		179.0	

[a] When not otherwise stated the high-water readings were taken on the gauges.

TABLE No. 2.— water and regu- d.

Designation of gauges.	Distance from Cairo.	Highest water, 1907. Date.	Highest water, 1907. [illegible]	Highest water, 1907. [illegible]	Difference between 1903 and highest of 1907.	Method of obtaining 1907 highest reading.[a]	Second rise of 1907, March–April. Elevation above Memphis datum.	Second rise of 1907, March–April. Method.[a]
	Miles.		*Feet.*	*Feet.*	*Feet.*		*Feet.*	
Sunflower Landing	352.7	Feb. 6	181.6	182.0	−0.4		176.6	
119	357.0		179.8	180.6	−0.8		174.01	Stain.
118	362.0	Feb. 5	178.3	179.4	−1.1		173.5	
117	366.8	Feb. 5, 6	176.2	177.8	−1.6		171.6	
116	371.8	Feb. 6, 7	174.4	176.5	−2.1	Stain	169.7	Do.
115	378.0	do	171.6	173.8	−2.2		166.9	
114	383.5	Feb. 6	169.7	171.7	−2.0		165.4	
113	389.5	do	168.6	171.0	−2.4		163.8	
Mouth of White River.	393.2	Feb. 7	167.5	169.3	−1.8		163.1	
112	398.5	Feb. 6	165.8	167.6	−1.8		161.5	
111	401.8	Feb. 7	164.9	166.6	−1.7		160.6	
110	408.0	do	164.6	164.8	−0.2		159.2	Do.
109	411.5	do	162.4	163.9	−1.5		157.7	
108	416.8	Feb. 8	161.9	163.3	−1.4	Stain	156.8	Do.
107	421.5	do	159.1	162.3	−3.2		153.8	
106	427.0	do	159.0	160.6	−1.6		153.9	
105	432.5	do	156.9	157.8	−0.9		152.3	
Arkansas City	438.3	do	155.4	156.3	−0.9		150.7	
104	444.8	do	152.9	153.5	−0.6		148.3	
103	449.5	do	152.0	152.7	−0.7		146.9	
102	454.0	do	148.7	149.7	−1.0		143.6	Do.
101	459.8	Feb. 7, 8	147.9	149.4	−1.5		142.5	
100	463.5	Feb. 9	147.8	148.6	−0.8		142.2	Do.
99	467.0	Feb. 8, 9	147.2	147.8	−0.6		142.0	
98	473.5	Feb. 7, 8	144.5	145.7	−1.2		138.5	
Greenville	478.3	Feb. 8, 9	142.2	144.0	−1.8		136.7	
97	482.5	Feb. 8	141.4	143.3	−1.9		136.1	
96	487.0	do	140.3	142.1	−1.8		135.4	Do.
95	489.8	Feb. 8, 9	139.8	141.4	−1.6		134.6	
94	495.3	Feb. 9	137.9	139.5	−1.6		132.4	
93	501.0	Feb. 8	136.0	137.3	−1.4		131.3	
92	505.5	Feb. 9	134.6	135.8	−1.2		129.3	
91	510.8	do	131.7	133.0	−1.3		126.6	
90	517.0	Feb. 8, 9	130.0	131.0	−1.0		125.3	Do.
89	522.5	Feb. 9	128.6	129.9	−1.3		123.4	
88	525.8	do	127.3	128.0	−0.7		121.6	Do.
87	531.5	Feb. 8–10	125.4	126.2	−0.8		120.7	
86	537.5	Feb. 9, 10	123.8	124.2	−0.4		119.1	
Lake Providence	542.3	do	122.8	123.0	−0.2		118.2	
85	546.8	Feb. 8–10	121.8	122.4	−0.6		117.4	Do.
84	552.0		119.4	120.7	−1.3		115.1	
83	556.5	Feb. 10	117.8	118.6	−0.8		113.6	
82	561.3		116.2	117.1	−0.9	Stain	111.6	Do.
81	568.0	Feb. 10	112.4	113.6	−1.2	Stain	109.7	Do.
80	573.5		110.3	112.0	−1.7		105.2	
79	578.0	Feb. 10–14	109.2	110.6	−1.4		105.0	
78	583.0	Feb. 13	107.8	109.5	−1.7		103.1	
77	588.5	do	105.7	107.6	−1.9	Stain		
76	593.5	do	104.5	106.3	−1.8	Stain		
Vicksburg	599.3	Feb. 11–13	102.6	104.7	−2.1		98.4	
75	602.8	Feb. 10–12	101.3	103.2	−1.9		96.9	
74	607.5	Feb. 11–13	100.3	101.9	−1.6		96.0	
73	612.5			99.3			93.3	
72	617.5	Feb. 13	95.7	97.2	−1.5		90.8	
71	622.0		94.6					
70	627.5	Feb. 15	92.7	94.5	−1.8		88.2	
69	633.0	Feb. 13	90.8	93.3	−2.6		85.6	
68	638.0		88.8	90.2	−1.4		83.0	
67	642.8		87.5	88.9	−1.4		81.0	
St. Joseph	648.3	Feb. 12, 13	85.8	87.7	−1.9		81.1	
66	655.3		83.2	85.0	−1.8		78.8	
65	659.8		81.1	83.8	−2.7		77.0	
64	663.8		81.0	82.9	−1.9		76.4	Do.
63	681.0		79.9	81.8	−1.9		75.6	
62	685.5			80.7			74.8	
61	691.5		76.1	78.5	−2.4	Stain	73.6	Do.
60	694.0	Feb. 13–15	75.2	76.8	−1.6		71.3	

[a] When not otherwise stated the high-water readings were taken on the gauges.

TABLE No. 2.—*Maximum heights above Memphis datum at high-water and regular gauges on the Mississippi River, etc.*—Continued.

Designation of gauges.	Distance from Cairo.	Highest water, 1907.		Highest of 1903.	Difference between 1903 and highest of 1907.	Method of obtaining 1907 highest reading.[a]	Second rise of 1907, March-April.	
		Date.	Elevation above Memphis datum.				Elevation above Memphis datum.	Method.[a]
	Miles.		*Feet.*	*Feet.*	*Feet.*		*Feet.*	
Natchez	700.3	Feb. 12-14	72.7	74.1	−1.4		69.0	
59	705.5	Feb. 12-16	71.6	72.9	−1.4		68.0	
58	711.3	Feb. 13	70.6	72.2	−1.6		66.7	
57	716.0	Feb. 15, 16	69.8	71.6	−1.8		66.2	
56	720.5		67.8	69.8	−2.0	Stain	64.2	
55	725.3		66.5	68.7	−2.2	do	63.1	Stain.
54	730.5	Feb. 16	65.0	66.5	−1.5		61.6	
53	737.5	do	64.0	65.5	−1.5		60.3	
52	742.8	Feb. 15, 16	62.5	64.4	−1.9		58.7	
51	747.0			63.6			56.9	Do.
50	751.5		60.4	62.8	−2.4	Stain	56.7	
49	756.0		58.9	62.0	−3.1		55.2	
48	761.0	Feb. 15, 16	58.2	61.4	−3.2		54.4	Do.
Red River Landing	765.3	Feb. 15	57.6	60.7	−3.1		54.0	
47	769.0		56.9	60.0	−3.1	Stain	53.2	
46	772.5	Feb. 18	56.5	59.6	−3.1		52.4	Do.
45	779.8		54.9	57.9	−3.0	Stain	50.9	Do.
44	784.8		54.0	57.3	−3.3		50.1	
43	790.5	Feb. 14	52.6	56.0	−3.4		48.2	
42	794.5	Feb. 15-17	51.7	55.1	−3.4		47.8	
Bayou Sara	799.8	Feb. 18	51.1	54.2	−3.1		47.1	
41	803.5	Feb. 19	49.7	52.8	−3.1		45.8	Do.
40	808.0	Feb. 17-19	49.6	52.8	−3.2		45.6	
39	812.5	do	48.2	51.4	−3.2		44.3	
38	817.0	Feb. 18, 19	47.2	50.4	−3.2		43.4	
37	822.5		46.8	50.0	−3.2		42.9	Do.
36	828.5	Feb. 19	44.7	47.8	−3.1		41.0	
Baton Rouge	833.3	Feb. 17-19	44.3	47.0	−2.7		40.4	
35	839.5		43.7	46.4	−2.7		39.9	
34	844.3		42.7	45.5	−2.8		39.1	
33	850.0			44.4			37.9	
Plaquemine	854.1	Feb. 17-19	41.3	44.1	−2.8		37.7	
32	859.8	do	40.2	42.8	−2.6		36.6	
31	864.5	do	39.4	42.0	−2.6		35.8	
30	870.0			41.0			35.1	
29	874.5			40.6				
28	880.0	Feb. 16-18	37.5	39.7	−2.2		33.9	
Donaldsonville	885.4	Feb. 16-19	36.4	38.8	−2.4		32.9	
27	889.8	do	36.4	38.5	−2.1		33.1	
26	895.8			37.4			32.1	Do.
25	900.3		35.0	36.2	−1.2	Stain	31.3	
College Point	904.5	Feb. 17-19	34.0	35.9	−1.9		31.0	
24	910.5			34.5				
23	914.8	Feb. 16	32.4	33.8	−1.4		29.1	
22	919.8	do	31.7	33.1	−1.4		28.5	
21	925.5	Feb. 12	30.7	32.2	−1.5		27.8	
20	930.5	Feb. 14, 15	30.0	31.1	−1.1		26.7	
19	934.3	Feb. 13-17	29.5	30.7	−1.2		26.6	
18	937.3	Feb. 15, 16	28.8	29.9	−1.1		25.8	Do
17	943.5	Feb. 16	28.2	29.2	−1.0		25.3	
16	947.3	Feb. 15, 16	27.8	28.9	−1.1		24.8	
15	953.0	Feb. 15-18	26.8	27.5	−0.7		24.1	
Carrollton	957.0	Feb. 16	26.4	27.2	−0.8		23.6	
Algiers	966.0	do	24.7				22.4	
14	968.0	do	24.2	24.6	−0.4		21.8	
13	973.5	Feb. 16, 17	23.7	24.1	−0.4		21.2	
12	979.3		22.6	22.8	−0.2		20.2	
11	983.5	Feb. 14	22.0	21.9	+0.1		19.6	
10	989.3	Feb. 18, 19	21.1	21.0	+0.1		18.7	
9	993.0	Feb. 12, 14-16	20.2	20.2	0.0		18.0	
8	999.0	Feb. 14-16	19.6	19.5	+0.1		17.5	
7	1003.8	Feb. 14-17	19.3	19.0	+0.3		17.3	
6	1008.3	Feb. 13, 15, 17	18.3	18.0	+0.3		16.4	
5	1013.0		18.4	17.8	+0.6	Stain	16.6	
4	1019.0	Feb. 9, 10	17.0	16.9	+0.1		16.4	
3	1023.8	Feb. 15, 16	17.0	16.7	+0.3		15.6	
2	1029.0	Feb. 10-16, 18-20.	15.9	15.8	+0.1		14.7	
1	1034.0		14.9	14.7	+0.2		14.0	
Fort Jackson	1039.0	Feb. 13, 14, 16, 18, 19, 21.	14.4	14.1	+0.3		13.4	
A	1045.3	Feb. 15-21	13.5				12.8	
B	1049.5		12.5				11.8	
C	1055.8	Feb. 19	12.0				11.6	

[a] When not *otherwise stated* the high-water readings were taken on the gauges.

TABLE No. 3.—*Cost of dredging operations May 1, 1906, to April 30, 1907.*

	Labor.	Office supplies.	Subsistence.	Fuel.	Lighting supplies.	Lubricants.	Materials.	New plant.	Total.	Grand total.
Care of plant	$35,473.03	$194.08	$6,769.96	$8,577.20	$156.90	$185.31	$412.76			$51,769.24
Repairs to floating plant:										
Dredge Beta	2,277.30		490.75	1,283.15	14.67	96.93	591.72		$4,754.52	
Dredge Gamma	3,043.72		690.97	272.08	.81	17.80	320.18		4,345.56	
Dredge Delta	3,012.13		714.60		6.54	18.94	782.74		4,534.95	
Dredge Epsilon	2,236.50		447.11		5.21	48.25	306.09		3,043.16	
Dredge Zeta	2,271.30		509.60		2.09	36.02	281.17		3,100.18	
Dredge Iota	2,560.23		561.59	92.00	8.74	75.44	784.81		4,082.81	
Dredge Kappa	2,395.35		489.86		2.66	29.20	196.70		3,113.77	
Dredge Henry Flad	1,876.06		394.40		.90	10.76	258.26		2,540.38	
Steamer Sachem	719.78		133.22		.31	5.58	78.98		937.87	
Steamer Choctaw	732.90		143.57	92.00	5.88	55.20	236.59		1,266.14	
Steamer Nokomis	1,487.55		326.41		3.18	30.72	141.15		1,989.01	
Steamer Wynoka	525.04		114.54		.09	32.71	62.15		734.53	
Steamer Leota	815.91		163.95	100.53	.27	17.36	170.06		1,268.08	
Steamer Minnetonka	151.50		37.13		.14	3.71	5.07		197.55	
Steamer Search	1,684.53		377.02		1.62	17.81	605.15		2,686.13	
Steamer Vulcan	667.64		151.90		.34	2.62	152.65		975.15	
Steamer Venus	528.39		117.46		.06	5.01	96.79		747.71	
Steamer Mars	373.68		87.03		.27	7.75	62.41		531.14	
Steamer Mercury	556.35		116.17		.14	4.23	95.49		772.38	
Pile sinker No. 971	1.91		.70			1.15	1.46		5.22	
Pile sinker No. 981	121.93		22.38			1.14	7.17		152.62	
Pile sinker No. 982	131.93		24.23		.09	1.08	1.70		159.03	
Pile sinker No. 983	37.09		6.21				.35		43.65	
Pile sinker No. 984	141.18		26.71			1.16	12.92		181.97	
Sectional docks	43.51		11.06				11.81		66.38	
Skiffs and lifeboats	170.97		45.32				4.56		220.85	
Ice cans for refrigerating plant	201.19		47.95		.05		23.23		272.42	
Pump boat	70.93		13.12			1.24	4.71		90.00	
Total	28,836.50		6,264.96	1,839.76	54.06	521.81	5,296.07		42,813.16	42,813.16
Operations during low-water season, 1906:										
Dredge Delta	6,056.30	7.36	1,454.32	1,385.40	14.30	35.95	415.90		9,369.53	
Dredge Epsilon	4,393.64	4.84	1,015.66	1,670.68	29.99	104.00	172.96		7,391.77	
Dredge Iota	8,633.88	7.69	1,801.20	2,938.81	47.97	112.91	172.31		13,714.77	
Dredge Kappa	2,990.91	1.15	747.07	815.05	34.35	120.70	188.23		4,897.46	
Dredge Henry Flad	6,187.45	9.06	1,203.89	1,488.98	43.46	124.96	108.43		9,166.23	
Steamer Search (inspection)	6,327.31	23.26	1,104.55	1,322.68	19.80	60.29	75.93		8,933.82	
Steamer Vulcan (surveys)	1,372.83	22.77	322.42	243.44	9.02	10.63	19.80		2,000.91	
Steamer Venus (surveys)	2,272.66	15.91	542.14	349.25	17.81	16.98	39.03		3,253.78	
Total	38,234.98	92.04	8,191.25	10,214.29	216.70	586.42	1,192.59		58,728.27	58,728.27
Protection of fleet during high water	223.08		45.89	156.60	1.96	25.97	5.30		458.80	458.80

Construction:										
Plate-bending rolls	60.00						205.77		265.77	
Carpenter shop	640.84		113.85		.21	1.44	741.14		1,497.48	
Boiler shop							38.72		38.72	
Storehouse							61.10		61.10	
Total	700.84		113.85		.21	1.44	1,046.73		1,863.07	1,863.07
Permanent outfit:										
Repaired	16.42		2.53				15.27		34.22	
Purchased								$2,382.69	2,382.69	
Total	16.42		2.53				15.27	2,382.69	2,416.91	2,416.91
Buildings and grounds	1,225.31		215.66		1.65	29.15	407.60		1,879.37	1,879.37
Miscellaneous:										
Testing coal	89.92		15.75	39.60	.18	.94			146.39	146.39
Coal lost in sunken barge				1,080.00					1,080.00	
Total	89.92		15.75	1,119.60	.18	.94			1,226.39	1,226.39
Repairs to tools and appliances	1,043.21		242.43		.18	2.10	46.27		1,334.19	1,334.19
Gardening	36.32		23.59						59.91	59.91
Total cost of dredging operations	105,879.61	286.12	21,885.87	21,807.45	431.84	1,353.14	8,422.59	2,382.69	162,549.31	162,549.31

TABLE No. 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1906.*

Name of bar.	Miles below Cairo.	Dates of trips, 1906.							
		Aug. 5 to Aug. 7.	Aug. 14 to Aug. 17.	Aug. 21 to Aug. 23.	Aug. 28 to Aug. 30.	Sept. 5 to Sept. 7.	Sept. 11 to Sept. 13.	Sept. 18 to Sept. 20.	Sept. 25 to Sept. 27.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Cairo gauge	0	17.6 to 17.1	16.4 to 17.8	19.3 to 20.6	19.0 to 20.1	18.0 to 17.6	17.1 to 17.4	16.6 to 14.8	14.2 to 17.6
New Madrid gauge	70	14.6 to 14.0	13.4 to 14.4	15.3 to 16.5	15.4 to 16.0	14.8 to 14.4	13.9 to 13.9	13.7 to 12.5	13.4 to 13.6
Nolans	76	16.5	.....	19.0	.....	.....	.....	.....	.....
Linda	82	a 12.0	12.0	13.0	15.5	12.0	11.5	11.0	12.0
Cherokee or Stewarts	90	.....	.....	19.0	.....	.....	.....	.....	16.0
Joe Eckles	93	.....	.....	.....	20.0	17.5	19.0	.....	12.0
Island 14	99	.....	.....	.....	19.0	.....	.....	.....	.....
Fritz	101	12.0	12.0	14.0	15.5	12.0	11.5	10.5	12.0
Hathaway	103	15.0	.....	18.0	17.0	19.0	.....	16.0	15.0
Cottonwood Point gauge	123	12.3 to 11.5	10.7 to 11.5	12.4 to 13.6	13.0 to 13.2	12.4 to 11.8	11.3 to 11.2	11.3 to 10.2	8.4 to 9.9
Foot of Island No. 20	128	17.0	.....	.....	.....	.....	.....	.....	.....
Foot of Island No. 21	133	16.5	.....	.....	17.0	16.0	16.0	.....	.....
New Haven	163	17.0	.....	.....	.....	.....	.....	.....	11.0
Last Chance or Bullerton	168	14.5	.....	.....	.....	.....	.....	.....	.....
Fulton gauge	175	12.2 to 11.5	10.6 to 11.2	12.0 to 13.0	12.8 to 12.5	12.3 to 11.6	11.2 to 11.0	11.1 to 10.3	8.6 to 9.8
Pecan Point	195	16.0	.....	21.0	24.0	19.0	16.0	.....	.....
Walts or Densmore	198	17.0	.....	18.0	19.0	16.0	15.0	19.0	12.0
Corona	203	14.5	.....	16.0	17.0	15.0	12.0	12.0	10.0
Old River	214	.....	.....	.....	.....	.....	.....	.....	.....
Arthur	222	14.0	12.5	18.0	16.5	16.5	16.5	15.0	13.0
Memphis gauge	230	12.3 to 11.1	10.2 to 10.4	11.3 to 12.2	12.6 to 12.0	12.1 to 11.3	10.6 to 10.4	10.6 to 10.0	7.8 to 8.3
Presidents Island	235	.....	.....	.....	.....	.....	.....	.....	.....
Fleeces	244	.....	.....	.....	.....	.....	.....	.....	.....
Polks	265	.....	.....	.....	.....	.....	.....	.....	.....

a Crooked.

TABLE No. 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1906*—Continued.

Name of bar.	Miles below Cairo.	Dates of trips, 1906.						
		Oct. 18 to Oct. 20.	Oct. 22 to Oct. 23.	Oct. 25 to Oct. 27.	Oct. 30 to Oct. 31.	Nov. 1 to Nov. 3.	Nov. 7 to Nov. 9.	Nov. 15 to Nov. 17.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Cairo gauge	0	17.5 to 16.1	15.5 to 15.1	14.8 to 13.6	14.9 to 15.0	14.8 to 13.8	12.8 to 12.2	12.0 to 12.1
New Madrid gauge	70	14.8 to 13.4	12.8 to 12.5	12.2 to 11.4	11.8 to 12.2	12.2 to 11.5	10.8 to 10.8	10.2 to 10.2
Nolans	76	.....	.....	.....	.....	.....	.....	.....
Linda	82	12.0	.....	12.0	12.0	12.0	12.0	10.0
Cherokee or Stewarts	90	.....	.....	.....	.....	.....	.....	.....
Joe Eckles	93	.....	.....	15.0	.....	.....	12.0	11.5
Island 14	99	.....	.....	14.0	.....	.....	.....	.....
Fritz	101	16.0	.....	11.0	12.5	12.5	10.0	11.5
Hathaway	103	.....	.....	14.5	.....	13.0	13.0	13.5
Cottonwood Point gauge	123	12.8 to 11.0	10.3 to 9.9	9.5 to 8.9	8.6 to 9.2	9.3 to 8.8	8.0 to 7.6	7.2 to 7.2
Foot of Island No. 20	128	.....	.....	.....	.....	.....	.....	.....
Foot of Island No. 21	133	.....	.....	14.0	.....	12.5	12.0	11.5
New Haven	163	.....	.....	.....	14.5	.....	.....	12.5
Last Chance or Bullerton	168	.....	.....	.....	.....	.....	.....	.....
Fulton gauge	175	13.0 to 11.2	10.4 to 10.0	9.6 to 9.0	8.6 to 9.0	9.2 to 9.0	8.2 to 7.8	7.4 to 7.5
Pecan Point	195	.....	.....	18.0	16.0	.....	12.0	14.0
Walts or Densmore	198	.....	.....	15.5	17.0	.....	16.0	13.5
Corona	203	15.0	12.0	15.0	13.0	12.5	14.0	11.5
Old River	214	.....	.....	.....	.....	.....	.....	11.0
Arthur	222	.....	16.0	15.0	.....	17.0	16.0	11.0
Memphis gauge	230	13.4 to 11.0	10.1 to 9.4	9.0 to 8.6	7.8 to 8.1	8.3 to 8.3	7.5 to 7.0	6.6 to 6.9
Presidents Island	235	.....	13.0	.....	.....	.....	.....	.....
Fleeces	244	.....	18.0	.....	.....	.....	.....	.....
Polks	265	.....	15.0	.....	.....	.....	.....	.....

APPENDIX 1 A.

LAWS AFFECTING THE MISSISSIPPI RIVER COMMISSION, JULY 1, 1906, TO JUNE 30, 1907.

[PUBLIC—No. 168.]

AN ACT Making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums of money be, and are hereby, appropriated, to be paid out of any money in the Treasury not otherwise appropriated, to be immediately available, and to be expended under the direction of the Secretary of War and the supervision of the Chief of Engineers, for the construction, completion, repair, and preservation of the public works hereinafter named:

* * * * * * *

Improving Mississippi River, from Head of the Passes to the mouth of the Ohio River, including salaries, clerical, official, traveling, and miscellaneous expenses of the Mississippi River Commission: Continuing improvement, three million dollars, which shall be expended under the direction of the Secretary of War in accordance with the plans, specifications and recommendations of the Mississippi River Commission as approved by the Chief of Engineers for the general improvement of the river, for the building of levees between the Head of the Passes and Cape Girardeau, Missouri, and for surveys, including the survey from the Head of the Passes to the headwaters of the river, in such manner as in their opinion shall best improve navigation and promote the interests of commerce at all stages of the river: *Provided*, That on and after the passage of this Act the Secretary of War may enter into additional contracts for such materials and work as may be necessary to carry on continuously the plans of the Mississippi River Commission as aforesaid, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate six million dollars, exclusive of the amounts herein and heretofore appropriated: *Provided, further*, That the authorized sum last named shall be used in prosecuting the improvement for not less than three years, beginning July first, nineteen hundred and eight, the work thus done each year to cost approximately two million dollars: *And provided further*, That the money hereby appropriated and authorized to be expended, in pursuance of contracts or otherwise, or so much thereof as may be necessary, shall be expended in the construction of suitable and necessary dredge boats and other devices and appliances and in the maintenance and operation of the same, with the view of ultimately obtaining and maintaining a navigable channel from Cairo down not less than two hundred and fifty feet in width and nine feet in depth at all periods of the year, except when navigation is closed by ice: *And provided further*, That the water courses connected with said river, and the harbors upon it, now under the control of the Mississippi River Commission and under improvement, may, in the discretion of said commission, upon approval by the Chief of Engineers, receive allotments for improvements now under way or hereafter to be undertaken, to be paid for from the amounts herein appropriated or authorized.

* * * * * * *

The Secretary of War may appoint a board of five members, to be composed of three members of the Mississippi River Commission, one of whom shall be the President of such commission, and two engineer officers of the United States Army, to examine the Mississippi River below Saint Louis and report to Congress, at the earliest date by which a thorough examination can be made, upon the practicability and desirability of constructing and maintaining a navigable channel fourteen feet deep and of suitable width from Saint Louis to the mouth of the river, either by the improvement of said river or by a canal or canals for part of said route. In its report the board shall cover the probable cost of such improvement, the probable cost of maintenance, and the present and prospective commerce of said waterway, both local and general, upstream as well as downstream, and the said board may consider in connection with the examination herein provided for, the survey of a proposed waterway from Chicago to Saint Louis, heretofore reported; It shall also report whether other plans of improvement can be devised by which the probable demands of traffic,

TABLE No. 3.—*Cost of dredging operations May 1, 1906, to April 30, 1907.*

	Labor.	Office supplies.	Subsistence.	Fuel.	Lighting supplies.	Lubricants.	Materials.	New plant.	Total.	Grand total.
Care of plant	$35,473.03	$194.08	$6,769.96	$8,577.20	$156.90	$185.31	$412.76			$51,769.24
Repairs to floating plant:										
Dredge Beta	2,277.30		490.75	1,283.15	14.67	96.93	591.72		$4,754.52	
Dredge Gamma	3,043.72		690.97	272.08	.81	17.80	320.18		4,345.56	
Dredge Delta	3,012.13		714.60		6.54	18.94	782.74		4,534.95	
Dredge Epsilon	2,236.50		447.11		5.21	48.25	306.09		3,043.16	
Dredge Zeta	2,271.30		509.60		2.09	36.02	281.17		3,100.18	
Dredge Iota	2,560.23		561.59	92.00	8.74	75.44	784.81		4,082.81	
Dredge Kappa	2,395.35		489.86		2.66	29.20	196.70		3,113.77	
Dredge Henry Flad	1,876.06		394.40		.90	10.76	258.26		2,540.38	
Steamer Sachem	719.78		133.22		.31	5.58	78.98		937.87	
Steamer Choctaw	732.90		143.57	92.00	5.88	55.20	236.59		1,266.14	
Steamer Nokomis	1,487.55		326.41		3.18	30.72	141.15		1,989.01	
Steamer Wynoka	525.04		114.54		.09	32.71	62.15		734.53	
Steamer Leota	815.91		163.95	100.53	.27	17.36	170.06		1,268.08	
Steamer Minnetonka	151.50		37.13		.14	3.71	5.07		197.55	
Steamer Search	1,684.53		377.02		1.62	17.81	605.15		2,686.13	
Steamer Vulcan	667.64		151.90		.34	2.62	152.65		975.15	
Steamer Venus	528.39		117.46		.06	5.01	96.79		747.71	
Steamer Mars	373.68		87.03		.27	7.75	62.41		531.14	
Steamer Mercury	556.35		116.17		.14	4.23	95.49		772.38	
Pile sinker No. 971	1.91		.70			1.15	1.46		5.22	
Pile sinker No. 981	121.93		22.38			1.14	7.17		152.62	
Pile sinker No. 982	131.93		24.23		.09	1.08	1.70		159.03	
Pile sinker No. 983	37.09		6.21				.35		43.65	
Pile sinker No. 984	141.18		26.71			1.16	12.92		181.97	
Sectional docks	43.51		11.06				11.81		66.38	
Skiffs and lifeboats	170.97		45.32				4.56		220.85	
Ice cans for refrigerating plant	201.19		47.95		.05		23.23		272.42	
Pump boat	70.93		13.12			1.24	4.71		90.00	
Total	28,836.50		6,264.96	1,839.76	54.06	521.81	5,296.07		42,813.16	42,813.16
Operations during low-water season, 1906:										
Dredge Delta	6,056.30	7.36	1,454.32	1,385.40	14.30	35.95	415.90		9,369.53	
Dredge Epsilon	4,393.64	4.84	1,015.66	1,670.68	29.99	104.00	172.96		7,391.77	
Dredge Iota	8,633.88	7.69	1,801.20	2,938.81	47.97	112.91	172.31		13,714.77	
Dredge Kappa	2,990.91	1.15	747.07	815.05	34.35	120.70	188.23		4,897.46	
Dredge Henry Flad	6,187.45	9.06	1,203.89	1,488.98	43.46	124.96	108.43		9,166.23	
Steamer Search (inspection)	6,327.31	23.26	1,104.55	1,322.68	19.80	60.29	75.93		8,933.82	
Steamer Vulcan (surveys)	1,372.83	22.77	322.42	243.44	9.02	10.63	19.80		2,000.91	
Steamer Venus (surveys)	2,272.66	15.91	542.14	349.25	17.81	16.98	39.03		3,253.78	
Total	38,234.98	92.04	8,191.25	10,214.29	216.70	586.42	1,192.59		58,728.27	58,728.27
Protection of fleet during high water	223.08		45.89	156.60	1.96	25.97	5.30		458.80	458.80

Construction:										
Plate-bending rolls	60.00						205.77		265.77	
Carpenter shop	640.84		113.85		.21	1.44	741.14		1,497.48	
Boiler shop							38.72		38.72	
Storehouse							61.10		61.10	
Total	700.84		113.85		.21	1.44	1,046.73		1,863.07	1,863.07
Permanent outfit:										
Repaired	16.42		2.53				15.27		34.22	
Purchased								$2,382.69	2,382.69	
Total	16.42		2.53				15.27	2,382.69	2,416.91	2,416.91
Buildings and grounds	1,225.31		215.66		1.65	29.15	407.60		1,879.37	1,879.37
Miscellaneous:										
Testing coal	89.92		15.75	39.60	.18	.94			146.39	146.39
Coal lost in sunken barge				1,080.00					1,080.00	
Total	89.92		15.75	1,119.60	.18	.94			1,226.39	1,226.39
Repairs to tools and appliances	1,043.21		242.43		.18	2.10	46.27		1,334.19	1,334.19
Gardening	36.32		23.59						59.91	59.91
Total cost of dredging operations	105,879.61	286.12	21,885.87	21,807.45	431.84	1,353.14	8,422.59	2,382.69	162,549.31	162,549.31

present and prospective, can be adequately met, and the sum of one hundred and ninety thousand dollars, or so much thereof as may be necessary, is hereby appropriated for the making of such survey, of which amount only one hundred thousand dollars shall be available, unless in presenting a plan for such waterway it shall be necessary, in the judgment of said board, to make a survey for a lateral canal or canals; and the force, plant, and records of the Mississippi River Commission shall be available for the use of said board in making said examination; and said board shall also at the earliest date practicable report upon the following:

First. What depth of channel is it practicable to produce between Saint Louis and Cairo at low water by means of regulation works.

Second. What depth will obtain in such regulated channel at the average stage of water for the year.

Third. For what average number of days annually will fourteen feet of water obtain in such regulated channel.

Fourth. What increase of depth will be obtained over the natural flow of water in such regulated channel by an added volume of ten thousand cubic feet per second; also fourteen thousand cubic feet per second.

Fifth. And the board shall consider further the practicability of producing at all seasons of the year a depth of fourteen feet in such regulated channel by the aid of locks and dams similar to those projected and in use on the Ohio River improvement.

Sixth. And the said Board shall also report upon any water power which may be created in the portion herein directed to be surveyed, as well as in the proposed waterway from Saint Louis to Chicago heretofore surveyed, and the value thereof, and what means should be taken in order that the Government of the United States may conserve the same or receive adequate compensation therefor, and upon any lands which may be drained by the construction of either of said proposed waterways, and shall also report what steps, if any, shall be taken to cause the cost of the improvement to be defrayed, in whole or part, by means of such water power or lands.

* * * * * * *

All surveys and examinations provided for by this Act, and the reports thereon, shall either be completed on or before the first Monday in November, nineteen hundred and eight, or else a preliminary report be made in which the reasons for delay shall be stated: *Provided*, That all reports of preliminary examinations and surveys which may be prepared during the recess of Congress, and be ready for printing, shall, in the discretion of the Secretary of War, be printed by the Public Printer as documents of the following session of Congress.

* * * * * * *

Approved March 2, 1907.

APPENDIX 2.

REPORT OF CAPT. WM. D. CONNOR, CORPS OF ENGINEERS, ON OPERATIONS IN THE FIRST AND SECOND DISTRICTS.

UNITED STATES ENGINEER OFFICE,
Memphis, Tenn., June 1, 1907.

COLONEL: I have the honor to submit the following report of operations in the first and second districts, Mississippi River improvement, for the year ending May 31, 1907:

The first district extends from Cape Girardeau, Mo., to the foot of Island No. 40, a distance of 265 miles. Operations in this district include bank revetment work at Columbus and Hickman, Ky., and at New Madrid and Caruthersville, Mo.; systematic improvement of Plum Point reach, Tennessee and Arkansas; abattis dike work; upper St. Francis and Reelfoot levee districts, and lower St. Francis levee district to the milepost 139/140.

The second district extends from the foot of Island 40 to the mouth of White River (393 R.), a distance of 173 miles, excepting on the left bank, where it ends

at the Coahoma-Boliver County line (365 L.). Operations in this district include bank revetment work at Memphis, Tenn., and Hopefield Bend and Helena, Ark.; the improvement of Wolf River, Tennessee, bank protection in Walnut Bend and in Old Town Bend, the White River and upper Yazoo levee districts, and the lower St. Francis levee district south of milepost 139/140.

PART I.—CHANNEL WORK.

FIRST DISTRICT (CAPE GIRARDEAU, MO., TO FOOT OF ISLAND 40, 265 MILES).

Columbus, Ky. (*21 L.*)—(For description and previous history, see p. 3580, Report of Chief of Engineers, 1891. For last map, see map No. 1, Appendix 2, Report of Chief of Engineers, 1905, Supplement.) Special appropriation. (See general summary.)

Hickman, Ky. (*36 L.*).—(For references to previous history, see Report of Chief of Engineers, 1905, Supplement, p. 152. For last map, see map No. 2, Appendix 2 of same volume.) Special appropriation. (See general summary.)

Slough Landing Neck, Tenn. (*60 L.*).—This neck has been under observation for several years, and the river threatens to make a cut-off at this point. No work will be required at this point this year, but the neck will be kept under observation. (See map No. 1 herewith.)

New Madrid, Mo. (*71 R.*).—(For references to previous history, see Report of Chief of Engineers, 1905, Supplement, p. 152.) Special appropriation. (See general summary.)

Caruthersville, Mo. (*110 R.*).—(For references to previous history, see Report of Chief of Engineers, 1905, Supplement, p. 152. See general summary and map No. 2 herewith.) An eddy at the lower end of this revetment had cut in behind the revetment and was destroying it at the lower end. Under an allotment made for this point it was decided to protect the lower end of this revetment by means of a pocket mat and to make a few slight repairs to the pavement wherever it was necessary. The plant was started for this point on August 3 and work was finished on August 27. Owing to the small amount of brush and poles needed, it was cheaper to get them out by day labor than to pay a contractor for towing his plant from Memphis to Caruthersville. One pocket mat 150 feet square was constructed and sunk at the lower end. Seven hundred and eleven cubic yards of grading and 333 square yards of paving were necessary to put the bank in proper condition and to repair the small breaks in the pavement. The following table shows the cost of these repairs:

Labor, subsistence, and superintendence		$1,345.83
Brush, labor, subsistence, and teams; 425 cords, at $2.52		1,290.50
Coal		42.86
Strand, $\frac{5}{16}$-inch, from stock on hand (763 pounds)	$19.38	
Strand, $\frac{1}{4}$-inch, from stock on hand (1,387 pounds)	40.30	
Clips, $\frac{5}{16}$-inch, from stock on hand (95 number)	12.06	
Wire, No. 12, from stock on hand (467 pounds)	11.21	
Staples, from stock on hand (35 pounds)	.86	
Stone, from stock on hand (250 yards)	450.00	
		533.81
Towing		370.62
Total		3,583.62

225 squares, at $15.93 per square.

Paving 333 square yards:

Labor, subsistence, and superintendence	256.01
Towing	33.51
Total	289.52

333 square yards, at $0.87 per square yard.

Total cost of pocket mat, including general office expenses, surveys, care of and repairs to plant, and depreciation:

Field cost	$3,583.62
Office expenses	71.34
Surveys	224.52
Care of and repairs to plant	411.35
Depreciation	600.01
Grand total	4,890.84

Total cost of paving, including general office expenses, surveys, care of and repairs to plant, and depreciation:

Field cost	289.52
Office expenses	0.00
Surveys	56.13
Care of and repairs to plant	34.28
Depreciation	50.00
Grand total	429.93

Chute of Island 26 (150 L.).—The chute behind this island has seemed to grow larger from year to year, and if the main body of the river were to go through this chute it would change the regimen of the river through Plum Point reach in a very marked manner. The chute should not be allowed to grow any larger, and some measures should be taken in the near future that would cause this chute to fill up. (See map No. 3 herewith.)

PLUM POINT REACH (147 TO 168 MILES BELOW CAIRO).

(For last map, see Report of Chief of Engineers, 1905, Supplement, Appendix 2, map No. 5. See general summary.)

The works of improvement in this reach extend from above Daniels Point to near Craighead Point, Arkansas, a distance of about 17 miles (151–168). These operations were begun in 1882 and have been fully described in subsequent reports. In general terms the work done has been the closure of Osceola and Bullerton chutes by pile dikes; the partial closure of Gold Dust Chute by pile dikes and a brush and stone dam; the contraction of the low-water channel by dikes at Ashport bar, Elmot bar, and Plum Point; the revetment of caving banks above Daniels Point, throughout Ashport and Fletchers bends, along a part of the fronts of Osceola and Bullerton bars, at Plum Point and near Craighead Point; and the construction of levees along both banks of the river.

Details of work are as follows:

Daniels Point, Ark. (152 R.)—(For description and previous history, see Report of Chief of Engineers, 1903, Supplement, p. 170.) The present effective continuous revetment at this point is 5,400 feet long, of which the upper 5,000 feet is of fascine mattresses and the lower 400 feet is of dikes and small fascine mattresses.

Ashport Bend, Tenn. (155 L.).—(For references to previous history and for last map, see Report of Chief of Engineers, 1905, Supplement, p. 153.)

Fletchers Bend, Ark. (158–161 R.).—(For references to previous history, see Report of Chief of Engineers, 1905, Supplement, p. 153. See map No. 4 herewith.) The continued high water in the latter part of the season 1905 did not permit the completion of the pavement adjacent to mats 9 and 10, which were constructed and sunk in the season of 1905. The plant was moved to Fletchers Bend on August 27, 1906, in order to complete the pavement above referred to. It was found that the connecting mats that had been placed the previous year were all so high up on the bank that but little further work was necessary. One hundred and ninety-five linear feet of bank was graded and 494 square yards of bank was paved. The following table shows the cost of this work:

Repairs to old work, Fletchers Bend Arkansas.

Construction:

Labor, subsistence, and superintendence	$1,207.43
Miscellaneous material	170.54
Coal	63.66
	1,441.63

Towing:		
Labor and subsistence	$248.85	
Coal	120.00	
		$368.85
Total		1,810.48

Total cost of repairs, including general office expenses, surveys, care of and repairs to plant, and depreciation:

Field cost	1,810.48
Office expenses	21.00
Surveys	336.78
Care of and repairs to plant	205.67
Depreciation	300.01
Grand total	2,673.94

Middle and Lower Osceola bar (163 R.).—(For references to previous history see Report of Chief of Engineers, 1905, Supplement, p. 153. See map No. 5 herewith.) There has been no apparent change in the situation along these bars during the past year. It is possible that in the near future an abattis dike may have to be constructed across Osceola Chute in case any tendency to deepen in this chute is observed. The upper end of this revetment is practically all carried away, and the caving continues quite active along this bend, but no immediate work at this point is necessary.

Lower Osceola and Bullerton bars, Ark. (165–168 R.)—(For statement of condition of this work and for last map, see Report of Chief of Engineers, 1905, Supplement, p. 153.) There is no change in the condition of the revetment along these bars from that reported last year. An allotment was made for Bullerton bar in 1906, but the high stage of the river made it impossible to make the few repairs to the revetment that had been thought necessary. These repairs will be made during the coming year. Work in this district was in charge of Assistant Engineer A. J. Nolty.

SECOND DISTRICT (FOOT OF ISLAND 40 TO WHITE RIVER, 173 MILES).

Hopefield Bend, Ark. (227–230 R.).—(For description and previous history, see Report of Chief of Engineers, 1905, Supplement, p. 154. See map No. 6 herewith.) The operations for 1906 consisted in making a few repairs to the revetment in this bend. Two small pocket mats, numbers 39 and 40, were placed from station 0 + 62 W. to 1 + 77 E. and the bank above this mat was graded and paved. The bank was also paved from station 6 + 50 W. to station 8 W.; from station 33 E. to 34 E.; station 15 E. to 16 E., and from 20 E. to 24 E. Work was begun on September 4 and completed on October 4. The following is the cost of the work in detail:

Pocket mats Nos. 39 and 40:		
Labor, superintendence and subsistence		$529.92
Coal		78.54
		608.46
Brush and poles (left from Caruthersville work), 122 cords, at $2.65	$323.30	
Stone (old stock), 88 cubic yards, at $1.5786	138.92	
Strand, ¼-inch, old stock (522 pounds), at $2.91 per cwt	15.19	
Strand, 5/16-inch, old stock (295 pounds), at $3.60 per cwt	10.62	
Clips, 5/16-inch, old stock	22.94	
Wire No. 12 (174 pounds), at $2.18 per cwt	3.79	
Staples (31 number), at $2.75 per cwt	.85	
		515.61
		1,124.07

89 squares, at $12.63 per square.

Cost of paving:		
Labor, superintendence, and subsistence		$2,735.93
Coal, 2,216 bushels		219.38
Towing		59.94
		3,015.25
Stone (old stock), 840 cubic yards	$1,409.35	
Spalls (old stock), 225 cubic yards	355.19	
		1,764.54
6,139 square yards, at $0.778 per square yard		4,779.79
Total cost of pocket mats, including general office expenses, surveys, care of and repairs to plant, and depreciation:		
Field cost		1,124.07
Office expenses		2.00
Surveys		124.76
Care of and repairs to plant		127.32
Depreciation		185.72
Grand total		1,563.87
Total cost of paving, including general office expenses, surveys, care of and repairs to plant, and depreciation:		
Field cost		4,779.79
Office expenses		0.00
Surveys		374.28
Care of and repairs to plant		538.67
Depreciation		785.73
Grand total		6,478.47

Wolf River, Tenn. (*230 L.*).—(For references to previous history, see Report of Chief of Engineers, 1905, Supplement, p. 154.) There was no allotment made for work in this river in 1906, but the district officer was instructed to keep the mouth of the river open by dredging, whenever necessary, as far up as the incline belonging to the Chicago, Rock Island and Pacific Railway Company. A very high water throughout the year made very little dredging necessary in order to comply with these instructions. The dredge *Wolf* was put in commission on November 1, and worked until November 17, when operations were suspended on account of high water. The dredge was not taken off this work until November 22, when it was evident that the heavy rainfall that had occurred between the 17th and 22d would raise the Mississippi River to a very considerable height and render further dredging unnecessary. The total amount of material dredged was 7,420 cubic yards. Two stumps and one saw log were taken out of the river. An inspection of the dredged material from the bar in the mouth of the river showed that approximately 20 per cent of the dredged material at this point was sawdust. This sawdust comes from mills located on Wolf River, there being no other possible source for the same. I instituted proceedings against offending mill owners for obstructing the stream by dumping sawmill refuse into the same. The United States commissioner, after the preliminary hearing before him, would not bind them over to the United States court for trial, but I think that the desired end was obtained by the proceedings, and that no further trouble will come from that source. The following is a statement of the cost of the dredging:

Labor for dredge	$773.50
Labor for the tender	1,110.49
Engineers' supplies, etc	51.77
Coal	135.50
Total	2,071.26

7,420 cubic yards at 27.92 cents.

Commercial statistics of Wolf River.

Number of lumber manufacturing plants	9
Capital invested	$2,555,895
Value of finished product	$2,172,240
Amount paid in wages	$614,759
Timber sawed, feet B. M	51,166,075
Timber purchased on barges and in rafts, feet B. M	41,124,586
Value in logs at mill	$1,030,086
Towing plants employed:	
Steamboats (7), value	$67,000
Derrick boats (4), value	$18,000
Barges (19), value	$41,000
Freight cars transferred by the Rock Island Railroad Company's steamer *General Pierson*	26,798

Memphis Harbor, Tenn. (*230–232 L.*).—(For description and previous history, see reports of the Mississippi River Commission since 1882. See general summary, and map No. 7 herewith.)

Porter Lake, Ark. (*261 R.*).—The bank has been caving just above this point for several years, and the caving is making downstream. Owing to the location of Porter Lake, just behind the levee, a loop would be much more expensive than bank protection. No work will be required at this point this year, but will probably be required in the near future. (See map No. 8 herewith.)

Walnut Bend, Ark. (*281 R.*).—(See general summary and map No. 9 herewith.) The plant was moved to Walnut Bend from Old Town Bend beginning October 2, and was all on the work by October 15. At this time the bank had caved to within 675 feet of the levee at the nearest point, and at the rate of caving existing at that time the river would reach the levee in the spring of 1908. The location of the two dikes was decided upon, as shown on map No. 9, because of local conditions. The upper dike could not be placed any higher upstream, because the bar became very steep just above the site of Dike No. 1, and Dike No. 2 was put as far downstream as the upper end of the caving bend would permit. The distance between these two dikes is 970 feet. Fifteen hundred feet apart would have been a better spacing, but local conditions did not permit. The lower dike was carried out as far into the river as was deemed advisable in the interest of navigation, and the end of the upper dike was placed on a line connecting the end of the lower dike with the critical point in the caving bend below. Two dikes were used, with the expectation that the line of their outer ends would be the controlling line of the new bar that they would form. Work was carried on under rather adverse conditions, owing to the high stage of the water, and this explains the increased cost of these dikes over the estimate, which was $4.50 for river work and $5 per linear foot for bar work. The river reached a stage on the Mhoon gauge of 32.4 feet on December 1, and this high stage necessitated a lay up with practically a full force for ten days, and, in order to complete the work at all, it was found necessary to use Chinese anchors instead of the piling that is normally used in connection with the dikes for sinking the same. The last section of dike was sunk on December 1[illegible] in 63 feet of water, with a stage on the Mhoon gauge of 17.8 feet. The total length of dikes built was 3,209 feet, the upper one being 1,454 feet in length and the lower one 1,755 feet. The cost of these dikes is set forth in detail in the following table:

Labor, superintendence, and subsistence	$9,955.[illegible]
Brush, including labor, subsistence, and team hire, 1,264 cords, at $1.30 per cord	1,642.[illegible]
Stone, including loading, 1,107 cubic yards, at $1.839	2,036.[illegible]
Piling, 2,818 feet, at $0.075	211.[illegible]
Lumber, 70,622 feet B. M., at $14	988.[illegible]
Coal, 3,842 bushels, at $0.09 per bushel	380.[illegible]
Wire, No. 12 (5,000 pounds), at $2.70 per cwt	135.[illegible]
Wire, No. 12 (1,200 pounds), at $2.40 per cwt	28.[illegible]
Wire strand, ⅜-inch (9,300 pounds), at $2.59 per cwt	240.[illegible]
Clips, ⅜-inch (315 number)	28.[illegible]
Spikes, ¼-inch by 5-inch (207 pounds), at $2.67 per cwt	5.[illegible]
Spikes, 5/16-inch by 7-inch (428 pounds), at $2.99 per cwt	12.[illegible]
Bolts, ¾-inch by 12-inch (457 number), at $0.04447 each	20.[illegible]
Bolts, ⅜-inch by 11-inch (1,232 number), at $0.04447 each	54.[illegible]

Nails, 16d. (117 pounds), at $2.162 per cwt		$2.53
Nails, 60d. (1,853 pounds), at $2.162 per cwt		39.43
Washers (400 pounds), at $2.57 per cwt		10.28
Towing		707.00
		16,484.04
Stone, from stock on hand, 315 cubic yards, at $1.839	$580.39	
Coal, from stock on hand	481.25	
Wire from stock on hand (913 pounds), at $2.18 per cwt	19.90	
Wire strand, ¼-inch, from stock on hand (4,740 pounds), at $2.91	137.93	
Wire strand, 5/16-inch, from stock on hand (1,014 pounds), at $3.60	36.50	
Staples, from stock on hand (20 pounds), at $2.75	.55	
Clips, 5/16-inch, from stock on hand (970)	77.95	
Spikes, 5/16-inch, from stock on hand (122 pounds), at $2.99	3.65	
Nails, 6d., from stock on hand (343 pounds), at $2.162	7.42	
Strand, ⅜-inch, from stock on hand (2,086 pounds), at $2.69	54.03	
		1,339.57
		17,823.61

Cost per linear foot (3,209 feet), $5.554.

Cost of foot mat, 66 squares:

Labor, subsistence, and superintendence		168.48
Brush, labor, subsistence, team hire, 55 cords, at $1.30		71.50
Coal, 262 bushels		26.00
Clips, ⅜-inch (14 number)		.56
Wire, No. 12 (151 pounds), at $2.70 per cwt		4.11
		270.65
Stone, stock on hand (62 yards), at $1.839	$114.01	
Clips, 5/16-inch, stock on hand (34 number)	6.29	
Strand, 5/16-inch, stock on hand (440 pounds), at $3.60	15.84	
Strand, ¼-inch, stock on hand (930 pounds), at $2.91	27.26	
Staples, stock on hand (20 pounds), at $2.75	.55	
		163.95
		434.60

Field cost per square, $6.576.

Total cost of dikes complete, including general office expenses, surveys, care of and repairs to plant, and depreciation:

Field cost, including material from supplies on hand	$18,258.21
Material left over	373.74
Office expenses	674.67
Surveys	1,066.47
Care and repairs to plant (proportional part)	2,105.71
Depreciation of plant (proportional part)	3,071.49
Grand total	25,550.29

Helena, Ark. (*306 R.*).—(For references to previous history and for last map, see Report of Chief of Engineers, 1905, Supplement, p. 155. See General summary.)

Old Town Bend, Ark. (*324 R.*).—(See General summary and map No. 10 herewith.) The plant reached Old Town Bend September 7, 1906, and dike work commenced immediately. The location of the dikes in this bend was controlled by local conditions at this point, just as at Walnut Bend. The caving had gone on for so long that it was necessary to build the dikes about 10,000 feet above the point of active caving. The lower dike was located as far down stream as the foot of the sand bar would permit, and the dike was built as far out in the stream as the interests of navigation would allow. The upper dike was located at the most favorable point above, which was 1,370 feet above Dike No. 2. The work was prosecuted on the shore and on the river sections at the same time. The shore sections were built in place and anchored to the bar. The river sections were built on the mattress barges of the revetment plant, and when completed and ballasted were towed into position. Prior to

this, the anchor piles were driven, as shown in plate No. 13. (Report of Chief of Engineers, 1899, p. 3536.) After the barges, containing the section of dike about 270 feet in length, were placed in position, the anchor lines from the piles were securely fastened to the toe of the dike section, and when all was made fast the triggers were slipped and the dike sank into position. This method was successfully followed wherever the piling could be driven, and no sections of dike were lost during the season's work. At the outer end of the lower dike it was impossible to use these anchor piles on account of the high stage of the river (25.1 feet Helena gauge), and, in order to save delay, Chinese anchors were constructed and sunk upstream from the dike. The necessary anchor cables were made fast to these Chinese anchors and were later fastened to the dike sections. This method of sinking the dikes had not been used before, but was found to be very successful, and the dike was built into water whose depth would have prohibited the construction of the dike by the use of anchor piles. The work on these dikes was slightly more expensive than estimated for, on account of the high stage of water that prevailed throughout most of the work. Not only did this high water involve the use of Chinese anchors, but it also flooded the bar where the willow brush was being cut, carrying away a considerable quantity of brush that had been prepared, and necessitating a short lay up until the water fell so that the men could work on the bar. The location at Old Town Bend was almost as adverse as could be found in the river; Millers Point, across the river from the dikes, has been a very stable point for many years, and in order for the dikes to be at all successful they must deflect the current so as to cut away this point. The dikes built up a bar in their immediate vicinity and the caving at Millers Point is quite active, and, if time permitted, these dikes might be sufficient to build the bar well down into the bend. The critical condition of the levee along this bend precludes the possibility of waiting for such results, since the levee is only slightly over 100 feet from the caving bank at the present time. Old Town Bend will be revetted with the standard revetment during the present season. The following table shows the cost of this work in detail:

Labor, superintendence, and subsistence		$5,926.48
Brush, including labor, subsistence, and teams, 769 cords, at $1.069 per cord		822.06
Stone, including loading, 782 yards, at $1.839		1,438.10
Piling, 775 feet, at $0.075		58.12
Lumber, 38,832 feet B. M., at $14		543.65
Bolts, ¾ inch by 12 inches, 265, at $0.0444 each		11.78
Bolts, ⅝ inch by 11 inches, 785, at $0.0444 each		34.91
Washers, 295 pounds, at $0.0257		7.58
Nails, 16d, 95 pounds, at $2.162 per cwt		2.05
Nails, 60d, 950 pounds, at $2.162 per cwt		20.54
Strand, ⅜ inch, 6,351 pounds, at $2.59 per cwt		164.49
Wire, No. 12, 425 pounds, at $2.40 per cwt		10.20
Spikes, ¼ inch by 5 inches, 300 pounds, at $2.69		8.07
Spikes, ¼ inch by 8 inches, 178 pounds, at $2.99		5.32
Clips, ⅜ inch, 88		3.52
Coal, 1,112 bushels, at $0.099		110.10
Miscellaneous material		18.87
Towing		751.52
Care of plant in field		369.72
Total		10,307.08
Wire, No. 12 (old stock), 3,811 pounds, at $2.70 per cwt	$102.90	
Strand, $\frac{5}{16}$ inch (old stock), 1,487 pounds, at $3.60 per cwt	53.53	
Strand, ¼ inch (old stock), 5,285 pounds, at $2.91 per cwt	153.79	
Staples (old stock), 20 pounds, at $2.75 per cwt	.55	
Coal (old stock), 1,750 bushels, at $0.099 per bu	173.25	
		484.02
Total field cost of dikes		10,791.10

Cost per linear foot (2,160 feet), $4.99.

Cost of foot mats, 93.45 squares:		
Labor, superintendence, and subsistence		$280.00
Brush, including labor, subsistence, and teams, 165 cords, at $1.069		176.39
Strand, $\frac{3}{8}$ inch, 263 pounds, at $2.59		6.81
Wire, No. 12, 375 pounds, at $2.40		9.00
Clips, $\frac{3}{8}$ inch, 122		4.88
Coal, 100 bushels, at $0.099		9.90
Towing		43.74
Care of plant in field		21.52
Total		552.24
Stone (old stock), 201 cubic yards, at $1.839	$369.64	
Strand, $\frac{5}{16}$ inch (old stock), 263 pounds, at $3.60	9.47	
Strand, $\frac{1}{4}$ inch (old stock), 535 pounds, at $2.91	15.57	
		394.68
Total field cost of mats		946.92

Field cost per square, $10.14.

Total cost of dikes, complete, including general office expenses, surveys, care of and repairs to plant, and depreciation:	
Field cost, including material from supplies on hand	11,738.24
Material left over	481.50
Office expenses	321.50
Surveys	841.95
Care of and repairs to plant	1,371.16
Depreciation	2,000.04
Grand total	16,754.39

The work in the second district was in charge of United States Asst. Engineer M. Gardner.

PLANT.

During the year the plant was increased as follows:

One quarter boat for the survey party	$3,059.11
One small barge	460.50
Tools and appliances purchased or made during the year	1,589.94
	5,109.55
Less old material used	1,244.35
Total	3,865.20

The following plant was repaired during the year:

Steamer *Chisca*.—(This steamer was painted inside and out, a new capstan barrel was made, the capstan engines and wheel were repaired, the cabin was screened, and other minor repairs were made)	849.79
Steamer *Titan*.—(This steamer was painted, a new roof covering was put on, the boilers were covered 3 inches thick with magnesia covering, the wheel was repaired, and the furnaces and engines were overhauled	1,877.02
Steamer *Graham*.—(This boat was docked, repaired and painted, new cylinder timbers were put in, and the machinery was overhauled	1,026.52
Steamer *Abbot*.—(This steamer was docked and the hull was repaired; the wheel was rebuilt, the feed water heater, roof, and cabin were repaired, and the boat was painted)	784.75
Steamer *Itasca*.—(This steamer was docked, cleaned, and painted; new strainers were put in, one new sheet was placed in boiler, and minor repairs were made.) (This boat and the steamer *Abbot* will require new boilers, as the last inspection reduced the allowable steam pressure so much that neither boat can do good work.)	742.72

Hydraulic grader *No. 2*.—The hull of this grader was calked, and its machinery was overhauled)	$309.40
Grader *No. 9313*.—This grader had its machinery overhauled and its sides, rakes, and decks were calked)	316.75
Pile driver *No. 6*.—(This pile driver was docked and the hull was repaired. Repairs were made to the boiler, furnace, and engines)	475.51
Pile driver *No. 9*.—(This pile driver was docked and its hull was practically rebuilt. Repairs were made to the boiler, furnace, and engines)	1,381.42
Machine-shop boats (2).—(New shafting was fitted up, new machine tools were set up, and some alterations were made in the cabin of the carpenter shop)	429.94
Derrick boat *No. 3*.—(This boat was fitted up for loading brush, having been furnished with a wooden boom, 2 sets of brush grabs, and the necessary chains and appliances)	226.59
Dredge *Wolf*.—(This dredge received a general overhauling; a new roof was put on, a new pillow block was placed under the main shaft, and a new dipper handle was fitted to the dipper)	353.50
Dump scows (2).—(These scows were docked and their hulls were thoroughly repaired)	406.93
Quarter boat *No. 206*.—(This quarter boat was docked, and repairs were made to the hull, the roof was painted, the cabin was repaired, and other minor repairs were made)	924.70
Quarter boat *No. 25*.—(The cabin of this quarter boat was repaired and its hull was entirely rebuilt)	2,211.96
Seven quarter boats received repairs to hulls and cabins, and were calked while afloat	885.58
Floating dock.—(The hull, valves, gates, and siphons of the floating dock were repaired)	444.30
Mattress barges *Nos. 5, 6, 9308*, and *9312*.—(Minor repairs were made to the decks, platforms, ways, etc., of these barges)	314.07
Mooring barges *Nos. 1, 2, 9407*, and *9408*.—(These barges were calked and minor repairs were made)	278.30
Twenty-three material barges.—(These barges were calked and their decks and timberheads were repaired)	1,535.77
Skiffs and flats.—(The skiffs and flats were all put into serviceable condition, their sides and bottoms being repaired and calked)	298.50
Tools and appliances.—(Repairs were made to tools and appliances for construction parties, shop, fleet, and office use, etc.)	454.88
Miscellaneous.—(Under this head are included repairs not classified above, such as cleaning and oiling cables, steaming and washing blankets, repairing stoves, ranges, and furniture, etc.)	519.22
Total	17,048.12
Less old material used	1,448.07
Total repairs to plant	15,600.05
Care of plant	11,304.73
New plant	3,865.20
Coal used by construction parties and steamers	1,613.90
Total	32,383.88

The old material mentioned above consists of lumber paid for out of previous allotments.

The season's channel work was charged with its pro rata of the cost of care of and repairs to plant and depreciation of plant, and levees were charged with 5 per cent of these items. There remained $20,765.59 of the cost of care of and repairs to plant and $30,480 of depreciation of plant to be charged to 74,355 linear feet of existing revetment, making a cost per linear foot of 28 cents and 41 cents, respectively, for the year 1906–7.

Statement of cost of plant and depreciation during the year ending April 30, 1907.

Name.	No.	Original cost.	Valuation last year.	Repairs during year.	Depreciation.	Present value.
Barges, model	2	$7,500.00	$4,500.00	$139.50	$1,250.00	$3,389.50
Barges, model	3	10,650.00	30.00	.....	30.00	Condemned.
Barges, model	2	7,500.00	5,500.00	178.30	1,250.00	4,428.30
Barges, decked	2	6,200.00	2,300.00	132.00	1,033.33	1,398.67
Barges, decked	6	19,020.00	11,400.00	398.92	3,170.00	8,628.92
Barges, decked	5	14,000.00	11,000.00	352.30	2,333.33	9,018.97
Barges, decked	2	6,340.00	4,350.00	144.90	1,056.67	3,438.23
Barges, decked	4	12,400.00	9,100.00	268.40	2,066.67	7,301.73
Barges, decked	2	6,740.00	6,740.00	99.75	1,123.33	5,716.42
Barges, mattress	2	9,060.00	4,725.00	157.04	1,510.00	3,373.04
Barges, mattress	2	5,600.00	5,180.00	157.03	933.33	4,403.70
Barges, mooring	2	4,046.00	3,530.00	100.00	674.33	2,955.67
Boats, flat	1	450.00	240.00	40.00	75.00	205.00
Boats, flat	1	410.00	240.00	60.00	68.33	231.67
Boats, flat	1	496.00	280.00	50.00	82.67	247.33
Boats, flat	1	460.50	.....	.....	76.66	383.84
Dredge Wolf	1	8,000.00	5,040.00	353.50	800.00	4,593.50
Derrick boat No. 3	1	2,956.00	2,956.00	226.59	295.60	2,886.99
Scows, dump	2	6,572.00	4,160.00	406.93	657.20	3,909.73
Boats, quarter	3	10,935.00	4,470.00	353.26	1,093.50	3,729.76
Boats, quarter	2	[illegible] 00	5,800.00	2,211.96	729.00	7,282.96
Boat, quarter, No. 27	1	2,788.00	1,785.00	159.60	278.80	1,665.80
Boat, quarter, No. 29	1	2,741.00	1,854.00	48.45	274.10	1,628.35
Boats, quarter	2	9,800.00	7,634.00	1,127.80	980.00	7,781.80
Boats, quarter	1	3,059.00	.....	121.17	305.90	2,874.27
Boats, quarter	1	3,170.00	3,170.00	.....	317.00	2,853.00
Hydraulic grader	1	30,232.00	5,392.00	309.40	3,023.20	2,678.20
Hydraulic grader	1	3,823.00	3,815.00	316.75	382.30	3,749.45
Floating dock	1	9,475.00	8,660.00	444.30	947.50	8,156.80
Machine-shop boat	1	8,501.00	4,600.00	429.94	850.10	4,179.84
Towboat Chisca	1	25,900.00	14,313.00	849.79	2,072.00	13,090.79
Towboat Titan	1	23,500.00	15,405.00	1,877.02	1,880.00	15,402.02
Towboat Graham	1	9,500.00	7,955.00	1,026.52	760.00	8,221.52
Towboat Itasca	1	9,500.00	2,990.00	742.72	570.00	3,162.72
Launch Abbot	1	5,330.00	3,331.00	784.75	426.40	3,689.35
Steamer Unique	1	14,000.00	11,667.00	.....	840.00	10,827.00
Tools and appliances	.....	49,668.43	49,668.43	454.88	4,966.84	45,156.47
Pile drivers Nos. 6 and 9	2	.....	.....	1,856.93	.....	.....
Skiffs	20	400.00	400.00	148.50	66.67	481.83
Total	.....	358,012.93	234,181.43	16,528.90	39,249.76	213,123.14

PART II.—LEVEE WORK.

Upper St. Francis levee district (Cape Girardeau to 70 R.).—(For references to previous history see Report of Chief of Engineers, 1905, Supplement, p. 156. See map No. 11 herewith.) This levee district was extended during the past year to Cape Girardeau, Mo. There are two organized levee boards in this district, the Mississippi County levee board and the St. John levee board No. 1, New Madrid County, Mo. The territory comprised of the remaining land that will be protected by this levee system is not organized into any levee district. The total length of the levee and the total amount of land protected in the district bounded by these new limits can not be given until the project for the main line of levee has been approved by the Mississippi River Commission. The bond issue of the St. John levee board was not a success, owing to some legal difficulty, and these bonds have not yet been sold. The board has been reorganized and it is hoped that arrangements will soon be made to build the levee from New Madrid to James Bayou. Only one contract was let in this district in 1906. The time of completion of this contract is January 1, 1908. The details concerning this contract are set forth in the following table:

Location.	Miles below Cairo.	Cubic yards.	Price per cubic yard.	Estimated cost.	Remarks.
			Cents.		
26/20 to 28/26	30 R.	325,000	19.7	$64,025	Not commenced.

A force will be put on this work as soon as water conditions permit, that will complete this work within contract time. During the past year surveys have been made for the location of a levee line from Cape Girardeau, Mo., to Grays Point, Missouri. This short stretch is a depression through which water flows at very high stages of the Mississippi River, from whence it escapes into the St. Francis River, the Cache River, and the White River. A survey was also made to determine on a line from Commerce, Mo., to Birds Point, Missouri, thereby connecting the head of the former levee system at Birds Point with the highlands at Commerce, Mo.

During the year the local levee board let 227,000 cubic yards of work to be completed January 1, 1908, 20,000 cubic yards of which has been put in place.

Summary of earth in place.

	In place Apr. 30, 1906.	Added during year.	In place Apr. 30, 1907.	Under contract Apr. 30, 1907.
	Cub. yds.	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*
By United States	826,992	.....	826,992	325,000
By levee board	491,419	20,000	511,419	207,000
Total	1,318,411	20,000	1,338,411	532,000

Nothing was lost by caving banks.

Map No. 11 shows the profile of the present levee with the elevations of several important high waters marked thereon, and a key map to the levee referred to in the profile.

Reelfoot levee district (36–60 L.).—(For references to previous history, see Report of Chief of Engineers, 1905, Supplement, p. 157. See map No. 11 herewith.) On August 9, 1906, bids were opened and contracts were afterward made for the following work in this district:

Location.	Miles below Cairo.	Cubic yards.	Price per yard.	Contractor.	Remarks.
			Cents.		
9/28 to 13/0	48 L	186,000	15	Bondurant & Wilson	43 per cent completed.
13/0 to 15/0	52 L	181,000	17½	R. T. Tyler	21 per cent completed.
15/0 to 16/32	56 L	143,000	18⅞	.....do	30 per cent completed.
Total		510,000			

No work was done by the local levee board during the past year.

Summary of earth in place.

	In place Apr. 30, 1906.	Added during year.	In place Apr. 30, 1907.	Under contract Apr. 30, 1907.
	Cub. yds.	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*
By United States	482,991	147,600	630,591	362,400
By levee board	585,770	0	585,770	0
Total	1,068,761	147,600	1,216,361	362,400

Nothing was lost by caving banks during the past year.

Work on existing contracts was greatly delayed by overflows in January, February, and March, 1907, but will be completed during the present season. Map No. 11 shows the profile of the present levee with the elevations of several important high waters marked thereon, and a key map to the levee referred to in the profile.

Lower St. Francis levee district (79–298 R.).—(For references to previous history, see Report of Chief of Engineers, 1905, Supplement, p. 157. See maps

Nos. 12 and 13 herewith.) At the beginning of the year there were six uncompleted contracts in force at the following localities:

Location.	Miles below Cairo.	Cubic yards.	Price.	Remarks.
			Cents.	
93/0 to 93/17	177 R.	18,525	15	81 per cent completed.
139/15 to 139/37	218 R.	25,300	16	28 per cent completed.
140/0 to 141/0	218 R.	80,538	21	68 per cent completed.
144/32 to 145/52	224 R.	76,947	21	51 per cent completed.
147/41 to 148/0	226 R.	11,200	16	0 per cent completed.
202/0 to 204/0	280 R.	163,000	16.99	63 per cent completed.

The first and last pieces of work set forth in the above table have been completed. The contracts for the remaining work have been annulled and will be relet during the present season.

On August 9, 1906, bids were opened for the following work in this district, to be completed January 1, 1908:

Location.	Miles below Cairo.	Cubic yards.	Price.	Remarks.
			Cents.	
112/0 to 123/0	198 R.	415,000	16¼	25 per cent completed.
171/0 to 174/0	251 R.	177,590	16.40	12 per cent completed.
Total		592,590		

In the above contracts there were 13 acres of light grubbing, at $200 per acre, and 5 acres of heavy grubbing, at $250 per acre.

Roach & Stansell, contractors, of Memphis, Tenn., were the successful bidders. These two pieces of work are now covered by a sufficient force to complete them within the contract time.

The contract for a short loop at Caruthersville, Mo., station 28/25 to 28/40, was let to Mr. C. W. Little in March, 1907, and completed in April, 1907. This loop contained 16,867 cubic yards, at 12½ cents, amounting to $2,108.37.

The weather conditions during 1906 were exceedingly unfavorable. During the summer months excessive rains interfered very materially with the work. After November 1 practically no work could be done, except at very high points. The work from station 139/15 to 148/0, then under contract with the Talley-Bates Construction Company, could not be worked during this time, and although a sufficient force was on this work to have completed it before high water they were forced to move away by the continued high stage of water in the Mississippi.

Summary of work let by the St. Francis levee board of Arkansas, during the season of 1906–7.

Location.	Cubic yards.	Cost.	Remarks.
58/0 to 54/12	56,179	$10,112.22	Completed.
55/30 to 57/0	50,907	10,181.40	21 per cent completed.
82/30 to 82/35	[a] 3,000	480.00	Not commenced.
83/84	[b] 5,397	863.52	Completed.
88/30 to 94/0	192,717	32,761.89	27 per cent completed.
94/0 to 98/0	89,975	14,845.87	35 per cent completed.
137/0 to 139/15	172,500	31,050.00	Not commenced.
146/20 to 147/8	[a] 21,071	4,214.20	14 per cent completed.
181/0 to 191/0	440,000	72,600.00	38 per cent completed.
48/0 to 51/0	189,589	34,126.02	68 per cent completed.
168/8 to 169/6	[a] 2,807.	644.77	Completed.
115/0 to 117/0	[c] 21,176	2,752.88	30 per cent completed,
115/0 to 117/0	[a] 42,278	6,933.59	60 per cent completed.
Total	1,287,596	221,566.36	

[a] Banquette. [b] Dike. [c] Ditch.

During the year this board paid out $221,025.34 in cash and $51,500 in certificates, making a total expenditure of $272,525.34.

The following table shows the present status of work let by the lower St. Francis levee board in 1905 and not finished April 30, 1906:

Location.	Cubic yards.	Cost.	Remarks.
161/0 to 166/0	213,165	$32,678.19	Completed.
166/0 to 171/0	345,202	72,043.66	75 per cent completed.
M. D. Canal	40,000	12,100.00	82 per cent completed.
Total	598,367	116,821.85	

The levee tax in the lower St. Francis district has been increased from 6 cents an acre to 8 cents an acre, and a bond issue of $500,000 has been authorized for levee work in this district. This money will be expended during the next two years.

During the year there was built at the fleet, at an approximate cost of about $8,000, a dredge, something on the order of a steam crane, for the construction of levees. This machine has not yet been tested on actual levee construction, but is engaged in cutting a drain ditch from the river bank to the levee on mile 154, consequently its practicability as a levee builder has not yet been determined.

No levee has been lost in this district due to caving during the past year, although 1,500 feet of levee, containing 15,870 cubic yards, was abandoned on account of nearness of the caving bank. At Point Pleasant, Mo., 78 R.; Linda, Mo., 85 R.; Caruthersville, Mo., 110 R.; Cottonwood Point, Mo., 123 R.; Pattons, Ark., 240 R.; Porter Lake, Ark., 260 R., and Walnut Bend, Ark., 281 R., there is considerable caving bank that threatens the levee. These points will be kept under observation and the necessary measures taken to prevent any break in the levee at these points.

Summary of earth in place.

	In place Apr. 30, 1906.	Added during year.	In place Apr. 30, 1907.	Under contract Apr. 30, 1907.
	Cub. yds.	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*
By United States	8,211,759	245,443	8,457,202	516,831
By levee board	11,094,957	879,378	11,974,335	697,196
Total	19,306,716	1,124,821	20,431,537	1,214,027

Maps Nos. 12 and 13 show the profile of the present levee with the elevations of several important high waters marked thereon, and a key map to the levee referred to in the profile.

Upper Yazoo levee district (244–365 L.).—(For references to previous history, see Report of Chief of Engineers, 1905, Supplement, p. 158. See map No. 14, herewith.

The levees in this district are in such excellent condition and the local levee board is so well equipped to take care of them that no allotments for new work in this district were made during the past year. One incomplete contract, which was let on August 31, 1905, is still in force.

Location.	Miles below Cairo.	Cubic yards.	Price per cubic yard.	Remarks.
			Cents.	
75/36–79/0	320 L.	113,600	24.95	30 per cent completed.

The contractor moved back on this work on March 8, 1906, and had a force sufficient to easily finish it by September 15 had weather conditions permitted him to work. On September 22 the work was temporarily abandoned because the pits were filled with rain water, and the contractor moved on Government work under this office in the lower St. Francis district of Arkansas.

The local Board enlarged from 35/0 to 43/0, inclusive, from 50/0 to 57/0, inclusive, miles 60 and 73; 76/0 to 79/0, inclusive, mile 84; and on the Hushpuckana system sections 109 and 110, and sections 119, 120, and 121.

Total cubic yards put up	693,972
Cost of same	$157,738.43

The total expenditures of the Board for the year ending April 30, 1907, were $413,467.34.

Summary of earth in place.

	In place Apr. 30, 1906.	Added during year.	In place Apr. 30, 1907.
	Cubic yards.	*Cubicyards.*	*Cubic yards.*
By United States	7,381,917	34,604	7,416,521
By levee board	19,007,660	693,972	19,701,632
Total	26,389,577	728,576	27,118,153

Caving bank.—From Sunflower Landing (352 L.) to below Malones Landing (356 L.) the bank is caving rapidly. It is the intention of the levee board to build a loop from just above Malones to a point about 3 miles farther north. The work is to be let this season.

Nothing was lost by caving banks, and no levee was abandoned during the year.

Map No. 14 shows the profile of the present levee in this district, with the elevations of several important high waters marked thereon and a key map to the levee referred to in the profile.

White River levee district (306–385 R.).—(For references to previous history see Report of Chief of Engineers, 1905. Supplement, p. 159. See map No. 15 herewith.) At the beginning of last season the following contract, to be paid for out of balance of $70,000 allotment for 1904–5, was in force:

Location.	Miles below Cairo.	Cubic yards.	Price per cubic yard.	Remarks.
			Cents.	
38/35 to 45/0	344 R.	224,592	17.4	80 per cent completed.

The following are annulled contracts to be paid for out of balance of $200,000 allotted for 1905–6:

Location.	Miles below Cairo.	Cubic yards.	Price per cubic yard.	Remarks.
			Cents.	
26/0 to 28/4	335 R.	143,686	15	65 per cent completed.
28/47 to 29/29	336 R.	49,137	19	42 per cent completed.
29/38 to 30/16	337 R.	31,777	19	40 per cent completed.
30/50 to 33/5	339 R.	74,774	19	55 per cent completed.
33/38 to 36/0	342 R.	93,310	16	88 per cent completed.
63/22 to 64/45	385 R.	75,585	14.74	27 per cent completed.
Total		468,269		

The Talley-Bates Construction Company, which had the work set forth in the above table under contract, failed to put a force on this work during 1906, and for this reason their contracts have been annulled. A force of about 100 teams was put on this work by this office, and would have nearly completed

these uncompleted sections had not the weather conditions and high water interfered very materially. The work covered by these annulled contracts will be relet during the coming season.

On August 9 the following contract was made, work to be completed January 1, 1908, the contract to be paid for out of allotment of $50,000 for 1906–7:

Location.	Miles below Cairo.	Cubic yards.	Price.	Remarks.
			Cents.	
5/0 to 9/0	310 R.	238,710	21	29 per cent completed.

There were 4 acres of light grubbing, at $200 per acre.

Roach & Stansell were the successful bidders. At the present time there are two outfits at work on this contract, which will probably complete it within contract time.

The Cotton Belt levee district has contracted for the following work, but, although the outfits are on the ground, nothing has been done, owing to high water and the continued rains.

Location.	Miles below Cairo.	Cubic yards.	Price.	Remarks.
			Cents.	
4/0 to 5/0	309 R.	50,000	24.95	Not commenced.
9/0–10/0	316 R.	60,000	.....	Do.
Total	.....	110,000	.....	

Summary of earth in place.

	In place April 30, 1906.	Added during year.	In place April 30, 1907.	Under contract April 30, 1907.
	Cub. yds.	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*
By United States	8,044,626	96,838	8,141,464	243,581
By levee board	1,845,580	0	1,845,580	110,000
	9,890,206	96,838	9,987,044	353,581
Less levees abandoned up to 1906	232,500	.....	232,500	.....
	9,657,706	96,838	9,754,544	353,581

No levee was abandoned during the year.

Map No. 15 shows the profile of the present levee, with the elevations of several high waters marked thereon and a key map to the levee referred to in the profile.

The following tables show the amounts expended by the United States in the various levee districts for the year ending April 30, 1907:

Upper St. Francis levee district:	
Engineering	$127.21
High water	220.04
Surveys	1,221.34
Office	658.90
Inspection	11.22
Total	2,238.71
Reelfoot levee district:	
Construction	22,204.37
Engineering	1,738.48
Maintenance	17.50
High water	16.81
Office	1,179.31
Total	25,156.47

Upper Yazoo levee district:	
Construction	$6,403.27
Engineering	1,149.71
Surveys	5.50
Office	665.05
Inspection	39.29
Total	8,262.82
Lower St. Francis levee district:	
Construction	34,671.49
Engineering	3,991.63
Maintenance	2,217.60
High water	11,210.77
Surveys	481.65
Office	3,068.97
Inspection	146.36
Total	55,788.47
White River levee district:	
Construction	31,068.03
Engineering	4,505.15
High water	18,424.21
Surveying	496.00
Office	1,816.31
Inspection	435.57
Total	56,745.27

HIGH-WATER OPERATIONS.

The river has maintained a uniformly high stage throughout the entire year. In October there was a considerable rise which affected the channel work and levee work but which did not endanger the levees. Another such rise occurred in November and in December, and the river in January was above the normal stage for that time of year. During the month of January unusually heavy and continuous rains occurred over the Ohio and Cumberland river watersheds, causing the Ohio, Cumberland, and Tennessee rivers to rise rapidly and reach flood stages. The continued rising of these streams made it clear that a flood of considerable magnitude could be expected in the Mississippi River, and preparations were made for the usual high-water protection. The local boards in the upper St. Francis and Reelfoot districts were required to undertake the protection of the levee in their districts. The only assistance rendered them by the Government was to furnish the Reelfoot district 3,000 sacks, costing 4 cents each, and the services of a junior engineer. In the lower St. Francis district of Missouri, the local board undertook all protection work from the upper end of the district to the Missouri-Arkansas State line at mile 47/0, but subsequent events showed that no protection work was required. The lower St. Francis levee board of Arkansas undertook the protection work from the Choctaw railroad crossing, mile 151/0, to the lower end of the district, leaving the Federal Government to protect the levee from the Missouri-Arkansas State line, mile 47/0, to the Choctaw crossing. This Government work was divided into two sections. The upper section from mile 47/0 to mile 139/0 was put in charge of Junior Engineer W. C. Trigg and the lower section, from mile 139/0 to 151/0, in charge of Inspector W. H. Gowen.

On January 23 the U. S. S. *Graham*, loaded with supplies and carrying the various inspectors, etc., for the upper section, left Memphis, and went up as far as Caruthersville, Mo., landing these employees at their various posts, with instructions to ride over their sections (about 30 miles each) at least once daily. No trouble was experienced in the upper section and very little work was required. Some topping with teams was done on miles 116 and 119, and some sacking on the back slope on mile 139 where the levee was badly cut up by travel and showed signs of sloughing. The steamer *Graham* returned to Memphis February 5 and laid up at the fleet.

Within the limits of the lower section at miles 140, 141, 146, and 148 were the only sections of levee in this district that were dangerously threatened during the high water which culminated early in February. The forces working on the levee at these points, although sufficient to have finished the enlargement of these low sections had fairly good weather continued through November, December, and January, were utterly unable to do any work during these months on acount of rain and high water, and therefore the approach of a high water, which promised to be one of the largest on record at these points, made the most strenuous exertions necessary in order to save the levee from a break at one of these four points. Mr. W. H. Gowen, United States inspector, was in charge of the lower section. The four sections were topped with bags of earth and loose earth was thrown up on top of the bags. The dredge *Wolf* was used for this last purpose on the three upper sections and did the work very rapidly and economically. The section in mile 140 was 1,700 feet in length, in mile 141 was 1,000 feet in length, and in mile 146, 2,500 feet in length. The section in mile 141 finally developed into the most dangerous of all four, and it was seen that if a break occurred it would take place at this point. A bulkhead of timber was constructed along the back edge of the crown and sacks and earth were piled on the river side of this bulkhead. The continued rains during the rise in water made the work very difficult, and had not the weather turned cold on February 3 a break would probably have occurred in spite of all our efforts. Forty-one thousand five hundred sacks were used in this district. The total cost of the high-water operations in this district was $10,054.22.

White River levee district.—As soon as it became apparent that a very high stage of water could be expected early in February, the operations in the White River district were put in charge of United States Assistant Engineer M. Gardner. On January 26, with a full supply of materials, the steamer *Titan* was sent to the White River district. The district was subdivided amongst the junior employees in sections varying according to the work that would probably have to be done in each section. The Cotton Belt levee district undertook the protection of the levee from Helena to Westover (319 R.). It was at once seen that the most dangerous points were in the vicinity of Fair, Ark., along the unfinished portions of the levee, then under contract for enlargement with the Talley-Bates Construction Company, and in the vicinity of Avenue, Ark., at a point where W. F. Barbour & Son had failed to complete the work they had under contract. Wherever possible the levee was topped with scrapers and a large force of men was immediately put at work topping out the remaining sections with sacks and loose earth. A bulkhead of timber was built along the crown to support and protect the narrow topping. At one time a force of about 500 men were engaged in this work. The flood culminated at Helena on February 6. There were no sand boils behind the levee and all the attention was confined to raising the top of the levee so that the water would not overtop it, and to the protection of the back slope at points where sloughing threatened to occur. The Cotton Belt levee board rendered efficient aid in this high-water fight. The total expenses of the high-water operations in this district were $17,800.51. Extra exertions were made to prevent a break in the levee in this district for the reason if a break occurred at any of the threatened sections in order to close the levee again a long and expensive loop would have to be built, since the land immediately behind the present levee is so cut up with bayous and lakes that no short loop would have been feasible.

Only the ability and untiring energy of United States Assistant Engineer M. Gardner saved this levee from a crevasse.

Upper Yazoo levee district.—The protection of the levees in this district was left entirely to the local board, they being well equipped, financially and otherwise, to take care of this work. Preparations were made for any emergency, but the levees in this district are in such excellent condition that no trouble occurred.

About the middle of March it became evident that the river would again reach a flood stage, and inspectors were sent out in the lower St. Francis and White river districts to look after the safety of the levees.

In the lower St. Francis district nothing was required of them but a daily patrol of their respective stations. The river reached a stage of only 35.6 feet on the Memphis gauge, which the levees are amply able to withstand.

In the White River district a small brush and sack dike was put in on mile 43, where a great deal of trouble had been experienced during the previous high water by the strong current at that point cutting into the levee. Two rows of piling about 6 feet apart were driven in and well braced, then alternate

layers of brush and sacked earth, each layer about 2 feet thick, were put in until the top of the dike was raised well above the stage of water expected. This arrangement not only deflected the current, but prevented an eddy below the dike, as the layers of brush allowed a good deal of water to go through.

The inspectors were called in on April 9, the river having fallen to 28.5 feet on the Memphis gauge.

High-water expenses March–April, 1907.

Lower St. Francis levee district	$256.55
White River levee district	623.70

SURVEYS.

The usual low-water surveys of revetted banks, caving banks, etc., were made during the year. Several levee surveys were found necessary in order to complete the office records and to give information required for current work. The survey party was organized August 7, 1906, to make the various annual surveys as follows:

Slough Landing Neck (60 L.).—This survey, on account of bad weather conditions, took nine days and shows a decreased rate of caving on the upper side of the neck, while on the lower side the rate seems to have diminished. It is still active and the zeros of the corresponding bar lines have extended into the river in proportion to the caving opposite. The composition of the banks evidently has something to do with this difference, being clay on the upper side, while the lower side is mostly sand. A map accompanies this report.

New Madrid, Mo. (70 R.).—The annual survey over the revetment was made in four days. As the cross sections, which were plotted, show no change from previous years, no map is submitted.

Caruthersville, Mo. (110 R.).—The annual survey over the revetment was made in five days. The cross sections show practically no change from previous years. The map showing caving bank below the revetment accompanies this report.

Chute of Island 26 (150 L.).—This survey was made in five days and consists of shore lines and soundings over established ranges. The map submitted herewith shows an enlargement of all the cross sections and an increase in depth on all but three. It also shows continued caving on the river side of Island 26.

Daniels Point, Ark. (152 R.).—The annual survey over the revetment was made in five days. The sections show a small amount of caving of the top bank only from R. 22 to R. 32; the remainder shows practically no change. No map of this work is submitted.

Ashport Bend, Tenn. (154–157 L.).—A survey over the revetment was made in four days. The cross sections were plotted and show the usual scour beyond the mats on the lower 2,500 feet, where the revetment is most exposed to the action of the current. On the balance there is no change except at the head of the work, where the bar is slowly extending downstream.

Fletchers Bend, Ark. (158–161 R.).—A survey at this point was made in six days. Map of the survey is submitted herewith, and cross sections which were plotted and on file show practically no change on most of the ranges. The bar at the upper end is filling and making downstream. The channel sections do not indicate that an unusually large amount of water is going through Elmot Chute.

Osceola bar, Ark. (165 R.).—A survey was made in three days, and map submitted herewith shows the caving that has taken place at the head of the work. There has been no change on the remainder except at the lower end, where a scour has taken place on the head of the bar.

Bullerton bar, Ark. (168 R.).—A survey over the lower end of this revetment was made in four days and shows no change from previous years, except that the bar in front of the upper end is making downstream.

Hopefield Bend, Ark. (227–230 R.).—A survey over the revetment was made in eight days, showing but slight changes in the revetment. Map accompanies this report.

Memphis bar and revetment (229–232 L.).—A survey of the bar and revetment down to Beale street was made in five days, showing a fill of about one-half foot on top of the bar and a tendency to maintain the bluff bar, as shown in

previous surveys. R. 36 shows a decided fill over the pavement of wharf. The other ranges show practically no change from previous years. Map accompanies this report.

Porter Lake, Ark. (*261 R.*).—A survey was made to determine the rate of caving and the location of the levee. Seven thousand six hundred feet of base line was established and river cross section taken every 600 feet. Top of bank and levee were located, and old maps showing location of levee were found to be in error several hundred feet. Succeeding surveys will show the rate of caving. A map accompanies this report.

Walnut Bend, Ark. (*280 R.*).—A survey to show the rate of caving and locate the position and height of the sand bar above the caving bend was made in nine days. The work included the establishment of 17,650 feet of base line and connecting same with a permanent stone line. A base line was marked with permanent hubs, ranges established, and soundings taken. The shore line was located from Mhoons Landing to the end of the caving bend below Whitehall Landing. A survey was made in March to determine the effect of dikes constructed on the bar above. Both surveys are shown on map submitted herewith.

Helena, Ark. (*307 R.*).—The annual survey to determine the condition of the revetment and to observe the bank line was made in four days. The cross sections were plotted and show no change during the past year.

Old Town, Ark. (*325 R.*).—A survey of the caving bank below Old Town Landing and of the bar above was made in six days. A survey was made in February after the first high water to determine the effect of dikes built in the fall of 1906. Both surveys are shown on map of Old Town Bend, submitted herewith.

Malones Landing, Miss. (*356 L.*).—A survey of the caving bank from Sunflower Landing to below Malones Landing was made to show rate of caving and location of levees affected. This occupied four days. As the work will not be undertaken by the Government, no map of the survey is submitted.

The number of days on each survey includes Sundays and stormy days. The time consumed on each survey shows a decided decrease from that of 1904, as a result of establishing and permanently marking base lines and ranges.

The cost of the season's surveys is shown below:

Cost of surveys for season 1906–7, ending April 30, 1907.

	Days.	Services.	Subsistence supplies.	Fuel.	Other supplies.	Drafting room.	Total.
Memphis bar and revetment, Tenn	5	$187.63	$36.45	$11.62	$9.68	$36.00	$281.38
Hopefield Bend, Ark	8	299.76	57.68	18.96	15.52	57.12	449.04
Porter Lake, Ark	5	187.35	36.05	11.85	9.70	35.70	280.65
Walnut Bend, Ark	9	337.23	64.89	21.33	17.46	64.26	505.17
Helena, Ark	4	149.88	28.84	9.48	7.76	28.56	224.52
Old Town Bend, Ark	6	224.82	43.26	14.22	11.64	42.84	336.78
Malones Landing, Miss	4	149.88	28.84	9.48	7.76	28.56	224.52
New Madrid, Mo	4	149.88	28.84	9.48	7.76	28.56	224.52
Slough Landing Neck, Ky. and Tenn	9	337.23	64.89	21.33	17.46	64.26	505.17
Caruthersville, Mo	5	187.35	36.05	11.85	9.70	35.70	280.65
Daniels Point, Ark	5	187.35	36.05	11.85	9.70	35.70	280.65
Chute of Island 26	5	187.35	36.05	11.85	9.70	35.70	280.65
Ashport Bend, Tenn	4	149.88	28.84	9.48	7.76	28.56	224.52
Fletchers Bend, Ark	6	224.82	43.26	14.22	11.64	42.84	336.78
Osceola bar, Ark	3	112.41	21.63	7.11	5.82	21.42	168.39
Bullerton bar, Ark	4	149.88	28.84	9.48	7.76	28.56	224.52
Old Town Bend, Ark	9	337.23	64.89	21.33	17.46	64.26	505.17
Walnut Bend, Ark	10	374.70	72.10	23.70	19.40	71.40	561.30
Total	105	3,934.63	757.45	248.62	203.68	750.00	5,894.38

INCLOSURES.

The following inclosures accompany this report, of which they are parts:

Map No. 1.[a]—Slough Landing Neck.
Map No. 2.[a]—Caruthersville, Mo.
Map No. 3.[a]—Chute of Island 26.
Map No. 4.[a]—Fletchers Bend.
Map No. 5.[a]—Osceola bar.

[a] Not printed.

Map No. 6.[a]—Hopefield Bend.
Map No. 7.[a]—Memphis bar and revetment.
Map No. 8.[a]—Porter Lake.
Map No. 9.[a]—Walnut Bend.
Map No. 10.[a]—Old Town Bend.
Map No. 11.[a]—Upper St. Francis and Reelfoot levee districts.
Map No. 12.[a]—Lower St. Francis levee district, sheet 1.
Map No. 13.[a]—Lower St. Francis levee district, sheet 2.
Map No. 14.[a]—Upper Yazoo levee district.
Map No. 15.[a]—White River levee district.
} Profiles showing top of levees and high-water slopes.

Money statements and abstract of contracts in force will be forwarded July 1.
Respectfully submitted.

WM. D. CONNOR,
Captain, Corps of Engineers.

Col. CLINTON B. SEARS,
Corps of Engineers,
President Mississippi River Commission.

FINANCIAL STATEMENT.

Appropriation for "Improving Mississippi River," first and second districts.

HICKMAN, KY.

July 1, 1906, balance unexpended		$372.27
July 1, 1907, balance unexpended		372.27

NEW MADRID, MO.

July 1, 1906, balance unexpended		$2,520.85
July 1, 1907, balance unexpended		2,520.85

CARUTHERSVILLE, MO.

Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906		$5,000.00
August 23, 1906, amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	$185.63	
June 30, 1907, amount expended during fiscal year	3,225.04	
		3,410.67
July 1, 1907, balance unexpended		1,589.33

PLUM POINT REACH.

July 1, 1906, balance unexpended		$9,134.40
Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906		5,000.00
Amount allotted from appropriation for "Improving Mississippi River," river and harbor act approved March 2, 1907		25,000.00
		39,134.40
August 23, 1906, amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	$185.62	
June 30, 1907, amount expended during fiscal year	1,280.85	
		1,466.47
July 1, 1907, balance unexpended		37,667.93
Amount that can be profitably expended in fiscal year ending June 30, 1909		30,000.00

[a] Not printed.

July 1, 1906, balance unexpended		$10,656.08
Amount allotted from appropriation for "Improving Mississippi River," river and harbor act approved March 2, 1907		37,000.00
		47,656.08
August 23, 1906, amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	$371.25	
June 30, 1907, amount expended during fiscal year	3,057.66	
		3,428.91
July 1, 1907, balance unexpended		44,227.17
Amount that can be profitably expended in fiscal year ending June 30, 1909		30,000.00

MEMPHIS, TENN. (WOLF RIVER).

July 1, 1906, balance unexpended		$3,547.07
Amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	$214.00	
June 30, 1907, amount expended during fiscal year	1,015.42	
		1,229.42
July 1, 1907, balance unexpended		2,317.65

WALNUT BEND.

Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906		$25,000.00
Amount allotted from appropriation for "Improving Mississippi River," river and harbor act approved March 2, 1907		100,000.00
		125,000.00
Amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	$1,292.34	
Amount Treasury settlement, being amount paid Chicago, Rock Island and Pacific Railroad for freight on stone	229.68	
June 30, 1907, amount expended during fiscal year	17,180.45	
		18,702.47
July 1, 1907, balance unexpended		106,297.53
July 1, 1907, outstanding liabilities		100.00
July 1, 1907, balance available		106,197.53
Amount that can be profitably expended during fiscal year ending June 30, 1909		125,000.00

HELENA, ARK.

July 1, 1906, balance unexpended	$1,086.33
July 1, 1907, balance unexpended	1,086.33

OLD TOWN BEND.

Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906	$25,000.00
Amount allotted from appropriation for "Improving Mississippi River," river and harbor act approved March 2, 1907	165,000.00
	190,000.00

Amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	$822.03	
Amount Treasury settlement, being amount paid Chicago, Rock Island and Pacific Railroad Company for freight on stone	145.33	
June 30, 1907, amount expended during fiscal year	11,167.70	
		$12,135.06
July 1, 1907, balance unexpended		177,864.94
July 1, 1907, outstanding liabilities		44,900.00
July 1, 1907, balance available		132,964.94
Amount that can be profitably expended during fiscal year ending June 30, 1909		20,000.00

UPPER ST. FRANCIS LEVEE DISTRICT.

July 1, 1906, balance unexpended	$5,775.58
Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906	70,000.00
Amount allotted from appropriation for "Improving Mississippi River," river and harbor act approved March 2, 1907	160,000.00
November 13, 1906, amount refunded on account overpayment in voucher 119, January, 1906	.33
	235,775.91
June 30, 1907, amount expended during fiscal year	2,196.21
July 1, 1907, balance unexpended	233,579.70
July 1, 1907, outstanding liabilities	177,335.00
July 1, 1907, balance available	56,244.70
Amount that can be profitably expended during fiscal year ending June 30, 1909	100,000.00

REELFOOT LEVEE DISTRICT.

Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906	$100,000.00
December 20, 1906, amount refunded on account overpayment in voucher 15, October, 1906	.30
	100,000.30
June 30, 1907, amount expended during fiscal year	36,856.17
July 1, 1907, balance unexpended	63,144.13
July 1, 1907, outstanding liabilities	60,501.74
July 1, 1907, balance available	2,642.39

LOWER ST. FRANCIS LEVEE DISTRICT.

July 1, 1906, balance unexpended	$49,475.07
Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906	140,000.00
Amount allotted from appropriation for "Improving Mississippi River," river and harbor act approved March 2, 1907	225,000.00
February 16, 1907, amount refunded on account of faulty timber paid for on voucher 10, December, 1906	60.08
	414,535.15

Amount Treasury settlement No. 3496, being amount paid Southern Railway Company for freight on envelopes	$2.51	
April 11, 1907, amount transferred to Capt. G. R. Lukesh, Corps of Engineers, being cost incurred on account of the use of the U. S. steamer *Nakomis* in this district for high-water protection purposes	499.08	
June 25, 1907, amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	402.50	
June 30, 1907, amount expended during fiscal year	69,499.87	
		$70,403.96
July 1, 1907, balance unexpended		344,131.19
July 1, 1907, outstanding liabilities		265,986.00
July 1, 1907, balance available		78,145.19
Amount that can be profitably expended during fiscal year ending June 30, 1909		200,000.00

WHITE RIVER LEVEE DISTRICT.

July 1, 1906, balance unexpended		$95,461.89
Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906		50,000.00
Amount allotted from appropriation for "Improving Mississippi River," river and harbor act approved March 2, 1907		180,000.00
		325,461.89
June 25, 1907, amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	$115.00	
June 30, 1907, amount expended during fiscal year	58,204.59	
		58,319.59
July 1, 1907, balance unexpended		267,142.30
July 1, 1907, outstanding liabilities		47,811.97
July 1, 1907, balance available		219,330.33
Amount that can be profitably expended during the fiscal year ending June 30, 1909		100,000.00

UPPER YAZOO LEVEE DISTRICT.

July 1, 1906, balance unexpended	$36,404.29
June 30, 1907, amount expended during fiscal year	6,549.39
July 1, 1907, balance unexpended	29,854.90
July 1, 1907, outstanding liabilities	21,105.60
July 1, 1907, balance available	8,749.30

SURVEYS, FIRST AND SECOND DISTRICTS.

July 1, 1906, balance unexpended	$2,443.61
Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906	5,000.00
Amount allotted from appropriation for "Improving Mississippi River," river and harbor act approved March 2, 1907	5,000.00
	12,443.61

October 15, 1906, amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	$198.00	
June 30, 1907, amount expended during fiscal year	5,628.49	
		$5,826.49
July 1, 1907, balance unexpended		6,617.12
July 1, 1907, outstanding liabilities		217.12
July 1, 1907, balance available		6,400.00
Amount that can be profitably expended during fiscal year ending June 30, 1909		5,000.00

PLANT, FIRST AND SECOND DISTRICTS.

July 1, 1906, balance unexpended		$2,465.47
Amount allotted from appropriation for "Improving Mississippi River," sundry civil act approved June 30, 1906		35,000.00
Amount allotted from appropriation for "Improving Mississippi River," river and harbor act approved March 2, 1907		75,000.00
March 12, 1906, amount received from the Anderson Tulley Company in compromise of claim of the United States, for damages sustained by the U. S. steamer *Unique* in collision with the steamer *Marie J.* (not included in statement for last fiscal year)		25.00
October 20, 1906, amount allotted, being proceeds from sale of engineer property, approved by Acting Secretary of War, October 13, 1906		316.50
		112,806.97
Amount transferred to Capt. G. R. Lukesh, Corps of Engineers (in payment for coal)	$2,495.62	
June 30, 1907, amount expended during fiscal year	42,791.64	
		45,287.26
July 1, 1907, balance unexpended		67,519.71
July 1, 1907, outstanding liabilities		10,000.00
July 1, 1907, balance available		57,519.71
Amount that can be profitably expended during fiscal year ending June 30, 1909		50,000.00

MISCELLANEOUS.

August 13, 1906, amount received from the Chicago, Rock Island and Pacific Railroad Company for rent of Government pile driver	$45.00
October 6, 1906, amount received from sale of engineer property	316.50
February 26, 1907, amount received from the West Kentucky Coal Company for rent of Government pile driver	30.00
March 7, 1907, amount received from the West Kentucky Coal Company for rent of Government floating dock	50.63
March 21, 1907, amount received from B. F. Dame for rent of island in Mississippi River near Australia, Miss., for year ending February 24, 1908	1.00
	443.13
August 13, 1906, amount deposited to credit Treasurer United States on account rent of Government pile driver	45.00
October 6, 1906, amount deposited to credit Treasurer United States on account sale of engineer property	316.50
February 26, 1907, amount deposited to credit Treasurer United States on account rent of Government pile driver	30.00
March 7, 1907, amount deposited to credit Treasurer United States on account rent of Government floating dock	50.63
March 21, 1907, amount deposited to credit Treasurer United States on account rent of island in Mississippi River, near Australia, Miss., for year ending February 24, 1908	1.00
	443.13

Abstract of contracts in force June 30, 1907, "Improving Mississippi River," first and second districts.

Name of contractor.	Amount and character of work.	Rate.	Date of approval.	Date of beginning work.	Date of expiration of contract.
G. W. Fisher	Rent of river front at Memphis, Tenn.	[a] $50.00	(b)	Apr. 1, 1907	Mar. 31, 1908
Chas. H. Boyle	do	[a] 50.00	(b)	do	Do.
Fannie W. and Wm. E. Everest.	do	[a] 100.00	(b)	do	Do.
	Upper St. Francis levee district.				
Roach & Stansell	325,000 cubic yards levee work, station 26/20 to station 28/26.	[c] .197	Sept. 21, 1906	Sept. 1, 1906	Jan. 1, 1908
	19 acres grubbing	[d] 250.00			
	Reelfoot levee district.				
R. T. Tyler	150,500 cubic yards levee work, station 13/0 to station 15/0.	[c] .17½	Sept. 20, 1906	do	Do.
	15 acres heavy grubbing	[d] 200.00			
	1 acre medium grubbing	[d] 150.00			
	127,000 cubic yards levee work, station 15/0 to station 16/32.	[c] .18½			
	14 acres heavy grubbing	[d] 200.00			
	2 acres light grubbing	[d] 100.00			
Bondurant & Wilson	171,000 cubic yards levee work, station 9/28 to station 13/0.	[c] .15	Oct. 20, 1906	do	Do.
	8 acres heavy grubbing	[d] 165.00			
	2 acres medium grubbing	[d] 150.00			
	3 acres light grubbing	[d] 100.00			
	Lower St. Francis levee district.				
Roach & Stansell	428,000 cubic yards levee work, station 112/0 to station 123/0	[c] .165	Sept. 19, 1906	do	Do.
	1 acre medium grubbing	[d] 200.00			
	12 acres light grubbing	[d] 200.00			
	228,000 cubic yards levee work, station 171/0 to station 174/0.	[c] .164	Sept. 20, 1906	do	Do.
	4 acres heavy grubbing	[d] 250.00			
	1 acre light grubbing	[d] 250.00			
	White River levee district.				
W. F. Barbour & Son.	220,000 cubic yards levee work, station 38/5 to station 45/0.	[c] .1740	June 24, 1904	June 1, 1904	[e] Jan. 31, 1905
Roach & Stansell	212,300 cubic yards levee work, station 5/0 to station 9/0.	[c] .21	Sept. 20, 1906	Sept. 1, 1906	Jan. 1, 1908
	4 acres light grubbing	[d] 200.00			
	Upper Yazoo levee district.				
Roach & Stansell	100,000 cubic yards levee work, station 75/26 to station 79/0.	[c] .2495	Sept. 8, 1905	Sept. 1, 1905	[e] Mar. 1, 1906

[a] Per annum.
[b] Lease.
[c] Per cubic yard.
[d] Per acre.
[e] Time limit waived.

APPENDIX 3.

REPORT OF CAPT. G. M. HOFFMAN, CORPS OF ENGINEERS, ON OPERATIONS IN THE THIRD DISTRICT.

MISSISSIPPI RIVER COMMISSION,
THIRD DISTRICT,
Vicksburg, Miss., May 31, 1907.

COLONEL: I have the honor to submit the following report of operations in the third district, improving Mississippi River, for the year ending May 31, 1907:

The third district extends from the Coahoma-Bolivar County line on the left bank (365 L.) and the mouth of White River on the right bank (393 R.) to the latitude of Warrenton, Miss. (607 L.). The work on this section of the river includes bank revetment at Lake Bolivar front, Ashbrook Neck, Greenville, Longwood, and Fitlers Bend, Mississippi; Lake Providence, Louisiana Bend, Delta Point, and Reid-Bedford Bend, Louisiana; the systematic improvement of Lake Providence reach, which has been discontinued, and levee construction in the Lower Yazoo and Upper Tensas levee districts.

PART I.—CHANNEL WORK.

Lake Bolivar front, Miss. (*417 L.*).—(For description and previous history, see Report Chief of Engineers, 1903, Supplement, p. 220.) The work at this point consists of revetment, begun in 1888–89, to hold the caving bank and prevent the destruction of a large levee across the head of Lake Bolivar, which would have necessitated the building of a long and very expensive loop back of the lake. The effective revetment (see map No. 1, herewith) is 2,580 feet long, about 1,400 feet having failed recently. The subaqueous mattress for 860 feet is of the old woven type and for 1,720 feet is of the old type reenforced by the fascine type. All of the fascine mattress was constructed during the season of 1905–6, reenforcing the lower end of the old work.

For a number of years prior to 1905 the revetment was not subjected to a direct attack by the current, a narrow bar having formed a short distance out from the work and the tendency of the river being to make a channel outside this bar. Continued scouring away of Island 76 above and yielding of a hard point below altered conditions; the protecting bar was washed away, the main bar opposite built out, and the work at the lower end was exposed to the attack of a strong current. Owing to this attack, about 100 feet of the upper bank paving caved in and the indications were that the old mattress was breaking up along this section. In 1905–6 2,120 feet of fascine mattress was placed, reenforcing the lower end and extending the revetment 400 feet downstream. Operations during the past season consisted of minor work necessary to repair defects along the reenforced section.

On October 5, 1906, a small force began the work of repairs to the break at station 30, which was found impracticable to repair last season on account of the high stage of water. This break had increased in size since the revetment repairs were made. A small pocket mat was constructed containing 136 squares, between stations 29 and 31, and the upper bank slope regraded and repaved.

On October 15 a cave occurred in the lower part of the slope, at station 14, just where the reenforcing work of 1905–6 terminated. An effort to regrade the bank without putting in a shore mat proved unsuccessful at first, but at a lower stage of water a fairly good connection was made, and the broken slope regraded and repaved. On November 10 an extensive settlement at the lower end of the work, stations 4+70 to 3+70, took place, which afterwards extended and involved the last mattress constructed in 1905–6. This settlement was probably due to the washing out of the substratum of quicksand underneath, leaving a void, and as a result the bank settled bodily. The location of this break is immediately in front of the old outlet of Lake Bolivar.

In December, after a sharp rise had taken place, a portion of the revetment gave way on account of the continual caving back of Island 76, which has been in progress for several years, unmasking and exposing the old revetment of 1888–89 to the direct action of the main current of the river. The destruction of the revetment extended from the upper end of the reenforcing work put in last season, upstream about 1,000 feet. Fifteen hundred feet of

more of new revetment should be built this season to render this point secure. The exact length can only be determined after a survey. The field cost of the repairs made to Lake Bolivar front for the season was $7,518.29. (For details of work done, cost, etc., see statement No. 1, hereto appended.)

Ashbrook Neck, Miss. (*446 L.*).—(For description and previous history, see Report Chief of Engineers, 1903, Supplement, p. 220.) The work here (see map No. 2, herewith) consists of 10,100 feet of bank revetment built to prevent a cut-off. It has been necessary from time to time to reenforce and extend the original mattress, which was of the old-style woven type. There still remains 1,000 feet of the old work not reenforced; of the balance, 8,600 feet is reenforced with standard fascine mattress, and 500 feet is fascine mattress extension. As no repairs had been made to this revetment the previous season, on account of high stage of water after repairs at Bolivar were finished, the breaks in the upper bank slope which had been developed the previous season between stations 147–149 and stations 100–98, had both enlarged particularly the upper, necessitating a much greater amount of work than if conditions had been such that repairs could have been made during the preceding low-water season.

The upper break had extended upstream to station 151 and below to station 146, and the cave had extended both above and below and had worked back until a deep pocket was formed. The break in the upper bank revetment, stations 100–98, had also enlarged considerably. In the upper pocket a shore mat was constructed 425 feet long, containing 668 squares, and on the outside, lapping this and connecting with the original mattress, a channel mat 150 feet wide and 500 feet long was constructed.

The pocket not being exposed to the current, as an experiment a heavy layer of spalls was used without any large stone as a covering for the upper bank, except that at both ends, where the points were exposed and would be subject to the impact of the current, a layer of large stone was placed on the spalls in the usual manner.

At the lower break, stations 100–98, soundings indicated that the original mattress, both above and below, showed signs of failure, and it was deemed best to build a channel mat from station 105 to station 93, so as to complete the reenforcing work along this section of the revetment.

A channel mattress 1,200 feet long and 250 feet wide was built and 174 squares of pocket mat constructed to reenforce this part of the revetment. The upper bank along the entire length of the revetment was cleared of all timber and large brush so as to prevent the accumulation of sediment during high water, the weight of which on the upper bank had, in several cases, caused slipping in of the upper bank slope. An inspection made early in May, 1907, showed the entire work to be in good condition. No damage had apparently been done during the past high water.

The field cost of this work was $42,737.26; length of bank protected, 1,750 linear feet; cost per linear foot, $24.42+. (For details of work done, cost, etc., see statement No. 2, hereto appended.)

Greenville Harbor, Miss. (*478 L.*).—(For description and previous history, see Report Chief of Engineers, 1903, Supplement, p. 221.) The town and harbor of Greenville and the levee along its front are protected by bank revetment having an effective length of 12,100 feet, of which 1,400 feet is of the old woven type and 10,700 feet of such type reenforced with standard fascine mattress. (See map No. 2, herewith.)

The work done in 1905–6 consisted of the repair of a large break of the bank paving at stations 37–41 at the sewer outlet and the repair of a small break at stations 140–142.

The damage to this revetment during the high water of 1905–6 consisted of a break in the upper bank slope, due, it is thought, to the location of the old abandoned levee at the head of the revetment concentrating an abnormal flow with a rapid current over the bank at that point, which attacked the revetment from the rear. Gaps have been made in these old levees so as to allow the water, formerly impounded in the bend above at high stages and which entered the river again at the head of the revetment, to flow along the main levee and relieve the former conditions, thus preventing a recurrence of the trouble. A channel mat 200 feet wide, made in two sections, was sunk in front of the damaged part of the revetment, and the bank regraded and paved. The length of bank protected by these repairs is 600 feet; total field cost, $16,120.24; cost per linear foot, $26.87—. Some minor repair work will be necessary in cleaning out ditches and repairing washes in the upper paving on exposed points; otherwise the entire revetment appears to be in good condition. This repair work will

soon be undertaken at an estimated cost of $1,000. (For details of work done, cost, etc., see statement No. 3, hereto appended.)

Longwood, Miss. (*500 L.*).—(For description and previous history, see Report, Chief of Engineers, 1905, Supplement, p. 198.) Bank revetment was placed in the rapidly caving bend here in 1904–5, to prevent the destruction of a large levee, comparative studies having shown conclusively that a loop around the threatened section would be far more expensive. The work has an effective length of 4,200 feet and is of the standard fascine type. (See map No. 4, herewith.)

Conditions in the bend have improved; there is a deposit over nearly the whole of the revetment, while the bar opposite has receded all along the work, the recession varying from 600 feet at the lower end to 1,800 feet at the upper end. Immediately below the work the bank has receded about 150 feet, though farther downstream there is a hard point which has changed but little; still farther down, caving has been very active and has breached a section of the old levee which fortunately had been well covered by a new loop.

Though an allotment of $35,000 for the extension of this revetment had been made in 1905, no work was then inaugurated because the plant was fully occupied elsewhere, and the indications since have been that such extension can be postponed, perhaps indefinitely. No work was done last season.

Louisiana Bend, La. (*522 R.*).—(For description and history, see Report, Chief of Engineers, 1903, Supplement, p. 221.) The revetment of the caving bank in this bend was built in 1889 and 1893, and partly repaired in 1896–97; it was undertaken with a view of obtaining greater permanence of the channel throughout the reach below. About 4,000 feet of the lower end has been destroyed; this was of the old style woven type mattress except for 600 feet which had been reenforced with fascine mattress. Over half of the 11,820 feet of mattress still in place is covered by a bar at the upper end. (See map No. 5, herewith.) This revetment is in about the same condition as last season. No work has been done since 1897.

Lake Providence reach (*517–552 R.*).—(For description and history, see Report, Chief of Engineers, 1903, Supplement, p. 221.) This section of the river was selected by the Commission soon after its formation for improvement of the low-water channel by means of contraction works and revetment of caving banks. Though marked deepening of shallow crossings resulted, the work was finally discontinued because of the lack of funds and the enactment of a law limiting the use of bank revetment. Most of the structures which were comparatively weak have been destroyed, but a much improved low-water channel still obtains. In later years active revetment work was resumed at Louisiana Bend and Lake Providence, but with special objects in view.

Lake Providence, La. (*540 R.*).—(For description and previous history, see Report, Chief of Engineers, 1903, Supplement, p. 222.) The bank revetment here (see map No. 6, herewith) protects the town of Lake Providence and the important levee across the foot of the lake. It has an effective length of 12,600 feet, of which 2,200 feet is old type woven mattress, 700 feet is woven mattress reenforced with fascine mattress, 5,000 feet is fascine mattress reenforced with fascine mattress, and 4,700 feet is original fascine mattress.

No construction work was done in 1905–6, on account of the short season and the more urgent need of the plant elsewhere.

The damage done during the high water of 1905–6 consisted of the scouring out of a deep pocket, stations 67–75, and also a break in the upper bank slope and the settling of the mattress between stations 28 and 20—part of the old mattress work that had not been reenforced.

A mattress 680 by 200 feet was constructed in front of the pocket to cover the defects which had developed in the main mattress, as shown by surveys (see map No. 6, herewith), and a large pocket mat built in the pocket itself. This work was finished December 23, 1906. On December 28, as there seemed to be a prospect of a decline in the river, which was then nearly at a bank-full stage, the construction of a channel mat 230 feet wide was begun at station 28 to extend over the original revetment as far down as station 20. Early in January a rise was in sight that would go over the bank, and it became necessary to sink the portion of the mattress already constructed in order to prevent loss. This was done January 7, and mat building suspended for the season.

The entire shore line along the revetment was cleared of trees and large brush, similar to the work done at Ashbrook Neck. The field cost of these repairs was $26,180.67; length of bank protected, 700 linear feet; cost per linear foot, $37.40+. (For details of work done, cost, etc., see statement No. 4, hereto appended.)

January 16 the party was transferred to quarrying and loading stone.

Though this revetment is apparently holding well, the indications from the last survey are that considerable reenforcement work will be necessary next season to insure against threatened failure of about 2,000 feet of the mattress.

Filters Bend, Miss. (550 L.).—The new revetment provided for at this place was not undertaken on account of lack of the necessary outfit.

Delta Point, La. (598 R.).—(For description and history, see Report, Chief of Engineers, 1903, Supplement, p. 223.) This revetment was placed to hold the point and prevent further recession of the channel from the town and harbor of Vicksburg. It has an effective length of 5,900 feet, of which 4,600 feet is of old woven mattress, 600 feet is of woven mattress reenforced with fascine mattress, and 700 feet is of original fascine mattress. (See map No. 7, herewith.)

No work has been done since 1899; the revetment is apparently in good condition, and will probably need no repairs the present season.

Reid-Bedford Bend, La. (603 R.).—(See map No. 7½, herewith.) Bank revetment in this bend was authorized in August, 1906, and an allotment of $150,000 was made to protect about 12,000 feet of levee threatened by rapid caving. A revetment outfit and party were borrowed from the first and second districts, and work was begun in October, 1906.

This bend is one of the worst along the river as regards unfavorable conditions for work. It is a sloughing bank, where large sections settle down slowly and slide out. It has currents of great velocity, and deep water close to the bank. The numerous sections of abandoned levees each have their borrow pits whose impounded water seeps through the bank, accelerating its destruction, while behind the controlling levee is a swamp, the water from which also filters through the bank.

Channel mat No. 1, which was to cover the lower end of the proposed revetment, was begun October 19. After attaining a length of 761 feet it was lost November 8 while attempting to sink it. This mat was anchored with twelve steel cables from 1 inch to 1¼ inches in diameter, an increase of about 50 per cent over what has been demonstrated as ordinarily sufficient. In addition there was an increase in the strength of the mattress; these precautions being taken to overcome known difficulties to be encountered in this bend. All but two of the anchorages parted by the breaking of links of 1⅛ inch iron where the cables were shackled to the heavy chain around the mat head. It is thought that the failure must be accounted for by some conditions which relieved part of the cables and brought an excessive stress on one or a few of the others, and that they then parted in rapid succession. Such conditions may have resulted from the releasing of a great mass of drift as the mat head was lowered, which probably slackened some of the cables against which it had been riding. A great slide occurred opposite the mat head a few days before, and may have been a contributing cause in distributing the stresses ununiformly as the mat sunk. The mat head was, for more than half its width, on the bottom when the accident occurred. Neither the mat nor the mat head were apparently in the least damaged. Current velocity was 5.1 miles per hour; maximum depth, 72 feet. After the rupture of the cables the mat floated downstream and was stranded by the steamboats on a point about 4 miles below. Preparations were at once made to construct a second mattress, greatly increasing the strength and the number of the fastenings.

Mat No. 2 was swung into position November 15 and sunk the 28th. Vicksburg gauge at time of sinking, 28.8 feet; velocity, 4.79 miles per hour; maximum depth of water, 82 feet. This mat is 603 feet long. It was sunk further upstream than the intended location of the lost mat.

Mat No. 3 was sunk December 29. Its length is 938 feet. It lies below No. 2 and covers the part of the bank intended to be protected by mat No. 1. Vicksburg gauge at time of sinking, 35.2 feet; maximum depth, 97 feet; velocity, 3.85 miles per hour.

Mat No. 4 was to have been 1,000 feet long. Anchorage site was selected which would place the head of the mat 2,000 feet above No. 2. The abutment was driven and all preliminary work done when high water caused suspension of the work and a disbandment of the force, enough men being retained to care for the plant. Operations were not resumed until early in March, at which time it was decided to attempt mattress construction at a different location, to utilize $3,300 worth of perishable brush on hand, notwithstanding the fact that the water was out of the banks and rising. A high and heavy pile abutment,

strongly braced and anchored down with stone, was built about 600 feet above mat No. 2; and dead-men were sunk in a fragment of an old levee about 800 feet above the abutment. The mooring barges were held the proper distance out by means of another barge resting against the abutment. As the water rose the upper and most important dead-men pits began to fill with water, which softened the ground and rendered them insecure. It was therefore decided to transfer the outer cables to some large trees above; at first attachment was made to the trunks above the water surface, but the stress and leverage was too great and the trees began to topple over. The following expedient was then adopted to make attachment to a sufficient number of trees, and at the ground surface, to give a secure anchorage: A barge was placed about 250 feet below the nearest tree and a heavy cottonwood log placed amidship and athwart this barge. Five shore cables were run to as many different trees and looped around them, the loops being pushed down under water to the ground, there being 7 feet of water over the bank at the time. These cables were fastened to the log, and from this log two long cables were run to the mat. The barge was used so that the anchor cables could be adjusted from its deck, no dry land being available. Five cables were used to run to the trees as against only two to the mat, because, in the first place, the trees were all willow, and the ground having been under water about three months was very soft. Guide piles were driven every 120 feet along where the inshore edge of the mat would rest, so as to kept it out to about the mid stage contour. Further out than this the piles would have been in such deep water that the least pressure would have overturned them.

The mat was swung out March 13, finished to a length of 606 feet, giving a lap over No. 2 of 16 feet, and was sunk March 28. Vicksburg gauge, 42.5 feet; maximum depth of water, 91 feet; velocity (estimated), 2.75 miles per hour.

Three connecting mats were placed, all in front of mat No. 3. Two of these covered one pocket. All were made of sufficient reach to overlap the channel mat.

The principal grading was done to remove sections of abandoned levees from the caving bank, the river being too high to permit of a proper slope being obtained. No paving was done. (For details of work done, cost, etc., see statement No. 5, hereto appended.)

The foregoing revetment operations (with exception of Reid-Bedford) were under the direct supervision of Assistant Engineer Arthur Hider. Work at Reid-Bedford was under the supervision of Assistant Engineer Aug. J. Nolty. The above report and statements appended thereto embody the essential features of their detailed reports, which have been filed at this office.

Revetment work generally.—An effort was made to get as early a start as possible, but from various causes it was not until August 25 that mat building was begun.

Only one mat-building outfit was available for the extensive repair work needed on existing revetments; in order to work it to its full capacity, the mat-building party was transferred from point to point as soon as its work was completed, and was followed by a second bank paving party.

The first party began mat building at Greenville, Miss., August 25, and was transferred to Ashbrook Neck September 22; when the mat work was finished there, November 26, it was transferred to Lake Providence, Louisiana.

The second force, in adition to general bank paving work, completed all the repairs at Lake Bolivar front, and assisted the mat party at Lake Providence toward the close of the season.

The stage of water at the latter end of the season, from about November 23, was too high to do any upper bank revetment, and caused a practical suspension of operations a month later, the last mat begun at Lake Providence being stopped on January 7, 1907, when only 216 feet had been constructed; this mat was immediately sunk to prevent loss, as the river was then bank full and rising rapidly. For the past two years the seasons have been very unfavorable for revetment work on account of the high stage of the river; in both seasons the length of the working season was shortened at least a month on this account. Considerable delay was occasioned both at Ashbrook Neck and at Lake Providence on account of failure of the contractor to furnish brush and poles in quantities needed for rapid progress. Labor was temporarily transferred to him on several occasions to help out and load brush and poles; and some additional brush was cut independently by forces of this office.

Labor was scarce all the early part of the season; generally not more than half the force needed could be maintained. Men were brought from Memphis for the work, but the demands were so great all along the river that it was impossible to keep the force full.

STONE.

Quarrying stone for the season of 1906 began February 13. The first tow of barges arrived at the quarry on the 18th, and the last tow of stone reached Greenville May 31. Drilling and blasting was continued until July 7, when the quarry was shut down. About 7,000 cubic yards of stone were drilled and blasted ready for breaking. Much of this stone, being from top ledges, was of inferior quality and unfit for use. About ten days' delay to the towboat occurred during the season, due to insufficient force at the quarry, caused by difficulty in procuring labor. There was loaded on barges 16,813.2 cubic yards of stone, 379.2 yards of which was lost with barge *No. 570*, accidentally sunk in White River while en route to Greenville.

In the appended statement the cost of quarrying and loading is given at $0.8813 per cubic yard, to which add $0.6665, cost of towing, making total cost of quarrying and towing $1.55. Add to this the cost of unloading 13,018.4 cubic yards on the bank, at $0.1926 per cubic yard, and reloading same, at 30 cents, would make the cost of stone for the season, loaded on barges and ready for use, $1.937 per cubic yard. (See statement No. 6, hereto appended, for details of cost, etc.)

The quarry was again put in operation January 25, 1907, and the work is still in progress. There has been a continuous boating stage during the season, except for five days in February, when the river fell to 3.5 feet on the gauge.

The cost of quarrying, towing, and unloading stone to May 1, 1907, is given in statement No, 7, hereto appended.

So far this season the cost of quarrying and loading is $1.046—about 16 cents per cubic yard more than it was last year. This is due partly to the expense of cleaning the quarry of soft stone blasted from the top ledges at the close of last season's work and partly to the increased cost of labor which it has been necessary to transport from Little Rock to the quarry.

The average cost of reloading 5,194.5 cubic yards of stone from the reserve on barges at Greenville during the past season was 44 cents. Labor cost 23 cents; teams, 10 cents; tug and care of plant, 11 cents.

Reserve stone on the bank is as follows:

Location.	Cubic yards.	Price per cubic yard.	Value.
Greenville	26,935.87	$1.922+	$51,770.85
Lake Bolivar	4,495.70	2.304—	10,357.97
Lake Providence	1,455.30	2.93	4,263.42
Reid-Bedford Bend	1,252.00	2.60	3,255.20

PLANT.

The present revetment outfit, when the repairs are completed, will consist of—

2 towboats.
1 inspection and survey boat.
1 tug.
1 hydraulic grader.
1 gravel dredge.
2 mattress boats.
2 mooring barges.
9 material barges, first-class.
10 material barges, second-class.
1 line barge.
1 pile driver.
1 barge fitted for loading stone.
1 derrick boat.
2 office quarter boats.
8 men's quarter boats.

With the 2 mattress barges, 2 mooring barges, 10 material barges, and hydraulic grader authorized to be built the present season, the district will have sufficient plant for two independent revetment parties.

The present outfit consists of—

1 office quarter boat.
1 machine shop.
1 carpenter shop.
1 dry dock.
5 calking flats.

Repairs of plant from May 1, 1906, to April 30, 1907, were made at a cost of $20,089.93, as shown in detail in statement No. 8, hereto appended. New plant was purchased and constructed during the year, as follows:

1 steamboat for inspections and surveys	$12,000.00
1 dredge foat for dredging gravel	3,551.69
12 skiffs for use during high water	466.75
Total	16,018.44

The cost of care of plant for the year was $12,995.78. The average number of employees engaged in care and repairs of plant during the year was 32.

All the plant, except that in use by revetment parties and that required for loading and unloading stone, was moved from Greenville to Vicksburg, October 26–November 14, 1906. A list of the floating plant of the district is given in statement No. 9, hereto attached.

Operations under the heads "Stone" and "Plant" were under the direct supervision of Mr. Arthur Hider, assistant engineer. The foregoing report and appended statements thereto embody the essential features of his detailed report, which has been placed on file at this office.

PART II.—SURVEYS.

This work was undertaken under the usual project, and allotment of $5,000 providing for hydrographic surveys in the Third district.

The steamer *Thos. B. Florence*, of the Vicksburg engineer district, was used for the survey. She made a very satisfactory survey boat, so far as the quarters were concerned; she was able to accommodate the entire party comfortably, thus doing away with a quarter boat in tow. On account of her small breadth and great height between decks, in proportion, and small free board, great care had to be exercised in navigating her in the Mississippi, especially during rough weather.

The steamer was put in commission and party organized July 5 for the purpose of making hydrographic surveys and studies for new levee locations at the following points: Fitlers Bend (550–553 L.); Albemarle Bend (567–572 L.); and Reid-Bedford Bend (603–607 R.). The party proceeded at once to Fitlers and commenced work July 7; the Reid-Bedford survey was completed July 28, and the survey party disbanded temporarily July 29. The steamer was used for an inspection trip to Lake Providence and return, after which she was laid up and minor repairs made on her prior to undertaking the regular survey.

The party was reorganized August 6, and proceeding up the river, made hydrographic reach surveys in turn as follows: Mascot to Omega (578–579 R.); Matthews Bend (506–510 R.); and Chicot front (427–433 R.).

After completing the survey at Chicot front, work was commenced August 16 at Bolivar front, and the regular annual hydrographic surveys made as follows: Revetment and reach surveys: Bolivar front (413–418 L.); Ashbrook Neck (445–447 L.); Greenville Harbor (477–479 L.); Longwood (500–502 L.); Louisiana Bend (512–514 R.); Lake Providence (540–542 R.); Fitlers Bend (550–553 L.); and Delta Point (597–599 R.). Reach surveys: Leland Neck (469–471 R.), and Walkers Bend (485–490 R.).

The following table shows the expenditures covering the cost of the field work:

Pay rolls	$2,877.42
Subsistence	643.64
Coal	386.15
Miscellaneous supplies	258.33
	4,165.54
Office and office drafting	804.58
Total expended	4,970.12

From the field cost, the expenses of the inspection trip and the repairs to the steamer are to be deducted, viz:

Total field cost		$4,165.54
Less cost of inspection trip	$77.63	
Less cost of repairs to steamer *Florence*	232.07	
		309.70
Net field cost of surveys		3,855.84

The party was organized July 5, and disbanded October 7, with eight days intermission, July 29–August 7, while the steamer was being repaired, making a total of eighty-six days in the field, and field cost of $44.84 per day. The field cost per day last season amounted to $71.27—a saving in this season's cost of $26.43 per day. This was accomplished by a saving in coal bills, due to not having to tow a quarter boat, and the greater efficiency of the survey party; there was also a small reduction in the size of the party.

The distribution of time was as follows:

	Days.	Percentage of total time.
Time actually at work	56¼	66
Time lost on account of Sundays, legal holidays, and rain	20¾	24
Time lost moving	8¾	10
Total	86	100

The surveys made this season were of two general kinds, viz, combined revetment and reach surveys, and reach surveys. The reach surveys made at Fitlers, Albemarle, and at Reid-Bedford bends included also surveys for projected new levee lines.

The following statement shows the cost of each of the above kinds of surveys:

Character of survey.	Total time at work.	Length.	Cost per mile.
	Days.	*Miles.*	
Revetment and reach	50¼	12.0	$188.22
Reach and shore line	35¼	32.8	45.45

There were no changes in the methods of making the above surveys. The party was made up as nearly as possible of the men who served during the previous season, which accounts for the better general efficiency of the party. For detailed description of methods of making surveys, etc., see report of the Chief of Engineers for 1904, Vol. 9, page 241.

Comparison with previous surveys and discussion of results are made as follows:

Lake Bolivar revetment and reach (413–418 L.). (See map No. 1 herewith.)—The shore line above the revetment along the front of Island No. 76 has continued to cave. The active scour now sets in to the revetment at range 2+82, leaving 680 feet of the upper end of the revetment still masked by the lower part of the island. There is quite a general scour indicated along the unreenforced portion of the work, and failure is indicated between ranges 3+94 and 8+85. The reenforcement work of 1905–6 seemed to be holding well at the date of the survey, with exception of one small break in the upper bank work ranges 31+24 upper and 0+75 lower. The bar line appears to have receded slightly along the entire front as compared with the survey of November, 1905.

Ashbrook Neck revetment (445–447 L.). (See map No. 2, herewith.)—This survey indicates a continued deepening and scour along the entire length of the revetment; practically all the deposit heretofore indicated as overlying a number of the sections has disappeared. The work generally appears to be holding well, with exception of the break at ranges 149–147, which failure evidently included the entire width of mattress. Ranges 126–124 showed evidences of failure, and at range 99 a small break showed above the water level. The caving above and below the revetment was slight. A checked stadia line was

run across the neck, and sufficient shore line was run on both banks to cover the narrowest parts of the neck. The shortest distance across was determined to be 1,970 feet from top of bank to top of bank, across a line just back of lower range 12. The distance across just below the foot of the revetment is 2,165 feet.

Greenville Harbor revetment (477–479 L.). (See map No. 3, herewith.)—Above the revetment the shore line shows very slight caving. A very active attack and scour is indicated along the full length of the revetment. The failure at ranges 105–106 was forecasted by the previous survey, which extended finally from ranges 104–109. This break was repaired before the date of this survey. The general condition of the revetment appears to be good. The zero of the bar line shows alternate advance and recession, with about the same average position as for the past several years.

Longwood revetment and reach (500–502 L.). (See map No. 4, herewith.)—The revetment appears to be in excellent condition, with increasing fill over all sections along the upper portion of the revetment. There is no caving above and very little caving for 2,000 feet below the revetment. Below this point the caving has been very active. The zero of the bar line has advanced along the entire front. The bar is very low, however, being completely covered at about a 7-foot stage.

Louisiana Bend revetment (512–514 R.). (See map No. 5, herewith.)—There has been practically no change in the conditions along this revetment since the previous survey. The effective revetment extends from range 88 to 120. The upper end is covered by the Ashton bar and the lower end has been destroyed. The shore line below the effective revetment has changed very slightly.

Lake Providence revetment (540–542 R.) (See map No. 6, herewith.)—The upper end of this work is masked by the Longwood bar. Since the survey of January, 1906, the zero of the bar has moved downstream 300 feet, leaving 2,300 feet covered by the bar. Ranges 140–108 show a fill. Below range 108 the soundings indicate a very active attack along the balance of the revetment, with indications of failure at ranges 106, 72–62, 40–36, and 26–19. The zero of the bar line advanced along the lower portion of the revetment.

Delta Point revetment (597–599 R.). (See map No. 7, herewith.)—The shore line above the head of the revetment continues to cave slightly. The zero of the bar line advanced along the entire front. The revetment appears to be in good condition, the soundings showing very little change from the previous survey.

Chicot Front reach (427–433 R.).—Caving continued quite actively along the middle of this reach, but so far the levee has not been seriously endangered. The survey indicates continued caving along the entire front.

Leland Neck reach (469–471 R.). (See map No. 8, herewith.)—Caving continues slowly along the upper side of the neck. Very little change of depths or of position of the bar line developed on any of the sections sounded. The shortest distance from center of dike to shore line is the same as reported last season, viz, 1,100 feet.

Walkers Bend reach (485–490 R.). (See map No. 9, herewith.)—As forecasted from the previous survey, all the sections show that this bend has scoured very much deeper; the zero of the bar advanced and the secondary channel along the left shore filled considerably. This resulted in continued active caving between ranges 2 and 4. The shortest distance from shore line to center of levee was reduced from 850 feet to 800 feet.

Matthews Bend reach (506–510 R.).—Active caving continued along the entire reach. All the sections sounded indicated deeper scour and further advance of the bar line. It appeared that the levee would be seriously threatened along a length of about 1,500 feet.

Fitlers Bend reach and levee (550–553 L.).—The object of this survey was to collect data on which to base comparative costs of revetment and projected new levee. The sections sounded indicated continued active caving along the entire front, which in the near future would necessitate either the revetment of the bank or the construction of an extensive and costly loop.

Mascot to Omega reach (578–579 R.).—A new levee had been located on the right bank covering the levee in this bend, estimated to cost $70,000. Just before the date set for the opening of bids on the work it was observed that there had been a change in the set of the current along this shore, and this survey was made to determine the condition of the under-water slopes and the prospect of the caving ceasing along the right shore. There had been no previous survey with which to compare results, but all the soundings indicated easy slopes under water along the right shore, and a secondary channel was forming between the

middle ground and the left bank. From these facts it was forecasted that the caving would cease along the right shore, and on the strength of this the levee was cut down to a short loop, costing about $16,000. From recent observations this levee will last a number of years, and maybe indefinitely.

Albemarle Bend reach and levee (567–572 L.).—The survey here was for the same purpose as at Fitlers Bend. The sections sounded indicated continued active caving along the upper third of the bend, while along the lower two-thirds the caving might be expected to be very slight in the future. The levee survey indicated that with the construction of a comparatively short loop the question of bank revetment could be postponed several years.

Reid-Bedford Bend reach and levee (603–607 R.).—Surveys have been made along this reach for the past several seasons for the same purpose as this season's surveys at Fitlers and the Albemarle bends. All the sections sounded indicated continued active caving. The position of the bar line and the depths showed more acute conditions than ever before. The levee surveys indicated any new levee to be so very expensive and difficult to build that the revetment of the bank was almost imperative.

The organization of the survey party for the season was as follows: Assistant Engineer A. M. Todd, in charge; Inspector E. F. McMurtrey, chief of party; Inspector D. E. Pendleton and Surveymen R. J. Windrow and F. Eberspacher, instrumentmen. The results attained indicate that these men did their work thoroughly and efficiently.

All the notes were reduced in the field and, as far as possible, field sheets were also platted. These were sent in to the office and the finished drawings made by Mr. John Hilleke, draftsman. This method proved to be very satisfactory. All the maps and sections were ready soon after the surveys were completed, so that blueprints could be made and copies furnished to guide in construction work.

A new survey steamer has been acquired by purchase and altered somewhat to provide more coal space and better accommodations for the crew and survey laborers.

It is recommended that at least $7,500 per annum be allotted for surveys, so that more thorough study can be made of actively caving reaches and changes of channel in the third district.

Additional details are contained in the report of A. M. Todd, assistant engineer, which report has been filed at this office.

PART III.—LEVEE WORK.

Lower Yazoo levee district (365–592 L.).—(For detailed history, see Report Chief of Engineers, 1905, Supplement, p. 201, and reports of the Mississippi River Commission since 1882.) This district has a levee line 188.9 miles long, extending from the Coahoma-Bolivar county line to a point on Eagle Lake, and covering a river front of 213 miles. An isolated levee 8,300 feet long has been built near Vicksburg in connection with the diversion of the Yazoo River and the improvement of Vicksburg Harbor.

At the beginning of the year five of the six 1905–6 contracts had not been completed. One of these, stations 720–862, has since been completed by the placing of 644 cubic yards, while under the remaining four 127,038 cubic yards have been placed and 219,913 cubic yards are necessary to complete. Three of these contracts (stations 4025–4200, 1200–1375, and 1600–1800) have been annulled, no efforts having been made by the contractors for several months to move forces onto the works. No work has been done on the remaining contract (stations 1038–1226) since December, 1906. The time limit was waived by the Chief of Engineers. Every effort will be made to complete this contract during the coming season. (For details of contracts, etc., see statement No. 10, hereto appended.)

Two enlargement contracts, stations 2000–2100 and 2200–2300, and spur levee at station 1038, to cover the unused balance of the 1905–6 allotment, were let during the year. These involved the placing of 119,557 cubic yards, and have been completed. The price paid was 20.35 cents per cubic yard. (For details, see statement No. 10, hereto appended.)

Under allotment of $160,000 from appropriation of June 30, 1906, seven contracts, amounting to 649,000 cubic yards, were let, at an average price of 22 cents per cubic yard. A total of 35,138 cubic yards was placed during the year. (For details, see statement No. 10, hereto appended.) The Mississippi levee

board placed during the year 633,618 cubic yards. (For details, see statement No. 11, hereto appended.)

The following table shows the levees abandoned during the year:

Location new loops.	Miles below Cairo.	Station number of loops.			Length.		Cubic yards abandoned.
		Beginning of new.	End of new.	End of old.	New levee.	Old levee.	
Carsons	476	3999+93	4009+28	4010+09	935	1,016	45,500

The new loop constructed did not materially change the length of the levee line.

Summary of earth in place.

		Cubic yards.
In place April 30, 1906		38,356,092
Added by the United States	294,924	
Added by the levee boards	619,715	
	914,639	
Lost and abandoned	45,500	
		869,139
In place April 30, 1907		39,225,231

Required to complete to Commission grade and section, about 10,730,861 cubic yards, at an estimated cost of $2,682,715. Expenditures by the United States since 1882 amount to $5,015,267.15, and by the levee board (exclusive of rights of way, litigation, office expenses, etc.) to $3,531,152.12.

Progress has been slow on all the contracts, due to high water and excessive rainfall, the frequency of showers making the ground too wet for working.

Very little renewal of sod was necessary. One hundred and twenty-five dollars was expended for this purpose at stations 1200–1300 (496 L.).

Weeds were cut over 1,238 stations where the growth was rank, at a cost of $607.04.

Sixteen-foot gauges have been set every 2,500 feet from stations 3000 to 500 (432–490 L.), with elevations referred to Memphis datum, and 8-foot gauges were set from station 500 to the lower end of the district. Spikes were driven at the maximum height of the February high water.

Surveys have been made to show defects of the levee and other conditions affecting levee construction; a few special surveys of caving banks have been made since the high water.

Parkers to Dennis (367–373 L.).—The conditions on this front are practically the same as they were a year ago. The caving had then about reached the old levee, which it has not yet breached.

Waxhaw (392–394 L.).—Caving has continued along this front, and has breached the old levee during the past year; about 1,500 feet of it has caved into the river.

Terrene (395 L.).—There is but slight change along this front.

Bolivar (417 L.).—Caving along this front has been renewed with a decided increase over the last several years, and threatens to destroy the revetment and the levee crossing the head of Lake Bolivar if the caving is not checked this season.

Buck Ridge (418 L.).—Caving along this front is not rapid, protection being afforded by the Bolivar revetment.

Choctaw Bend (435 L.).—The situation along this front is practically the same as last year.

Bachelors Bend (475–497 L.).—Caving continues above the revetment in this bend.

Warfield Point (484 L.)—Caving at this point has been more active than last season, and threatens the levee at station 226.

Longwood Front (499 L.).—Caving has continued below the revetment.

Valewood (528 L.).—The present rate of caving along this front is very slight, the old levee in front of the loop being still intact.

Baleshed (538 L.).—Caving has been very active along this front, and is within about 40 feet of the levee.

Fitlers (552 L.).—Caving at this point has been very active, but the loop built in 1905–6 will probably insure the life of the levee a few years longer. Project for a revetment in this bend has been approved, but work on it has not been commenced, necessary plant not being available.

Cottonwood (557 L.).—Caving developed during the high water of this season and has been quite active. Part of the riverside slope of the levee for a distance of 150 feet has caved in, and for a distance of several hundred feet the caving is within a few feet of the base of the levee.

Duvalls (568 L.).—Caving has been active in this part of the bend. A new loop is under contract by the levee board.

Albemarle (569 L.).—Caving in this part of the bend has advanced very slightly during the year.

With the completion of all work now under contract the condition of these levees with reference to the highest water will be as follows: The entire line (188.9 miles), 2 feet or more above. This includes 27.3 miles of reduced section, 4 to 6 feet crown, and 2 to 1 riverside slope, all below Greenville. The levee is reenforced by banquettes as follows: 62.1 miles with grade 4 feet below highest water, 70 miles with grade 6 feet below, and 11.9 miles with grade 8 feet below; 10.8 miles are without banquette. The levee line and profile are shown on maps numbered 10, 11, 12, and 13 herewith.

After the recession of the 1907 high water a provisional grade was adopted of 3.5 feet to 4 feet above the highest water for the standard section, and to add a light topping 1½ feet high, with crown of 2 feet and slopes of 2 to 1. The following is an approximate estimate of the yardage required for the completion of the levee to this grade:

	Cubic yards.
Enlargement	7,400,000
Topping	300,000
Road crossings, grubbing, old borrow pits, etc	1,100,000
Banquette	700,000
Probable new loops	1,000,000
Total	10,500,000

The project for next year's work contemplates enlarging the lowest levees and those of reduced section to the above grade. Estimates for such enlargement have been made, as follows:

Stations.	Miles below Cairo.	Grade above 1903 high water.	Estimated contents.	Estimated price.	Amount.
		Feet.	*Cubic yards.*	*Cents.*	
Above Greenville:					
940–1038	338	4	100,000	23	$23,000
Below Greenville:					
1570–1670	503	4	161,000	23	37,030
1670–1800	504	4	161,000	23	37,030
2100–2200	514	4	143,000	23	32,890
2300–2440	517	4	144,000	23	33,120
3586–3700	547	4	145,000	23	33,350
4258–4670	556	4	522,000	25	130,500
4894–5018	569	4	149,000	25	37,250
4962–5160	570	4	224,000	25	56,000
Total			1,749,000		420,170

The field expenditures in this district for the year ending May 1, 1907, amounted to $94,327.89, of which 70.9 per cent was for construction, 0.9 per cent for repairs and maintenance, 1.1 per cent for surveys, 20.6 per cent for high water, and 6.5 per cent for engineering.

During the present year the river was above the danger line at Arkansas City from May 1 to 7, seven days; January 10 to February 22, forty-three days, and March 15 to April 16, thirty-one days; a total of eighty-one days in the three periods.

Work in this levee district was under the immediate supervision of Mr. E. C. Tollinger, assistant engineer. The above report and appended tables include the essential features of his detailed report, which has been filed at this office.

Upper Tensas Levee District (402–606 R.).—(For detailed history, see Report Chief of Engineers, 1905, Supplement, p. 203, and reports of the Mississippi River Commission since 1882.) The levees in this district consist of two lines—

one 17.5 miles long, being an extension of the Arkansas River levee below Red Fork, Ark., and the other, 172.7 miles long, being the Mississippi River levee, which begins on comparatively high ground at Costello's gin, extends in a southeasterly direction to the bank of the river, thence along the right bank to the limit of the district at Warrenton. The total length of levee line is 190.2 miles, protecting an area of about 2,500 square miles; in addition, about 500 square miles are protected from ordinary floods.

Since the date of the last report no work has been done on the uncompleted 1904–5 contract of McCadden, Morgan & Co. (stations 783–926, Arkansas River extension). The firm is no longer in existence, but the bondsmen have promised to make every effort to complete the work during the coming season. This will require the placing of 211,839 cubic yards.

Under allotment of $165,000 from appropriation of June 30, 1906, proposals were invited for the construction of 795,000 cubic yards of new work and enlargement. When the bids were opened it was found that the lowest prices were much more than the originally estimated cost, and all bids were rejected. The work was readvertised, with some modifications of the project and allowing a longer time for completion. Under the readvertisement proposals were opened August 25 and contracts made for 501,000 cubic yards. An additional contract was let in October for 97,000 cubic yards, making an approximate total of 598,000 cubic yards let during the season, at an average price of 23.41 cents per cubic yard. Of the work provided for completion this year there remains to be placed but 20,835 cubic yards on one contract; the others are to be completed January 1, 1908. (For details of contracts and work done, see statement No. 13, hereto appended.)

The levee boards let contracts for about 948,500 cubic yards, of which about 156,317 cubic yards were placed during the year. (For details, see statement No. 14, hereto appended.) Levee board work in Arkansas was inspected under this office when it could be done without involving additional expense.

Summary of earth in place.

		Cubic yards.
In place April 30, 1906		34,005,691
Added by the United States	208,626	
Added by levee boards	349,391	
		558,017
In place May 1, 1907		34,563,708

Required to complete to Commission grade and section, 13,651,000 cubic yards, at an estimated cost of $3,412,750. Since 1882 the United States has placed 25,152,006 cubic yards, and of the total yardage in place about 60 per cent has been paid for by the United States and about 40 per cent by the levee boards.

Weeds were cut in Louisiana by the fifth Louisiana levee board. In Arkansas 957 stations were cut under this office at a cost of $843.40, or 50.4 cents per station.

Repairs of rain wash, sloughs, etc., were made at a number of places, at a cost of $2,742.06. (For details, see statement No. 15, hereto appended.)

Surveys of caving banks and projected levee locations were made at various points. Continuous level lines were run over the top of a portion of the levee in Arkansas and Louisiana.

Surveys for new loops were as follows: Chicot Front (428 R.), Grand Lake (509 R.), Red Fork on Arkansas River, Chicot extension (428 R.), and Panther Forest (449 R.).

A continuous level line was run from Chicot to Sunnyside, in Arkansas. Seventy-seven high-water gauges were set with graduations reading direct to Memphis datum. Ninety-eight miles of continuous level line was run over top of levees in Arkansas and Louisiana. The cost of the surveys amounted to $2,308.06.

Conditions along the reaches where the levees are threatened by caving banks are as follows:

Lucca to Chicot (425–432 R.).—Caving opposite the angle at station 483 appears to have ceased to a large extent—the distance from levee to river bank remaining the same as in 1906. A new loop is under contract covering threatened points between stations 620 and 690. The Tensas Basin levee board proposes to let a contract for an extension of this loop, to cover the entire front below station 620, made necessary because of active caving commencing opposite

station 735, reducing the distance of 226 feet from river to levee previously obtaining here to 160 feet in one month.

Gaines to Panther Forest (420–435 R.).—Caving continues slowly opposite station 1530 and above. The closest distance of 566 feet has been reduced to 360 feet. Opposite station 1730 the bank stood without change until the water began to recede in February, when active caving suddenly began and in a few days the distance from center of levee to river bank was reduced from 500 feet to 240 feet. The United States has asked for bids on a new levee covering the angle at this station.

Walkers Bend-Vaucluse—(485–490 R.).—Active caving has continued in this locality. On account of high water covering the low bank at this point, it has been impossible to secure very recent measurements.

Matthews Bend (507–510 R.).—Caving has continued with greater activity than for many years past. A new loop was contracted for to cover the threatened levee, to be completed January 1, 1908; a protection loop was provided for in case it should be needed. Early in January bank measurements indicated that the levee would cave off about stations 3720–3730 before the high-water season was over. An emergency loop was laid out and the contractors commenced work at once. During the first rise the back levee was kept above the rising water as a precaution. The levee caved in two at station 3726 early in April, and the second rise in the river was held out by the protection loop. With the completion of the main levee the situation here will be made safe for a number of years; but if the hard cypress point below continues to give way as it has during the past year, the crossing of Grand Lake will eventually be seriously endangered.

Mascot to Omega (577–579 R.).—Owing to diminished rate of caving along this levee, the originally projected loop here was cut down from an estimated cost of $70,000 to approximately $16,000. Recent observations show that practically no caving has occurred during the year.

Millikens Bend (Morancy, 582 R.).—Caving has been very slow and gradual in this bend from year to year. After the flood receded, it being evident that the batture at station 3310 was so narrow the present location of the levee could not be relied on longer with safety, the board of State engineers of Louisiana contracted for a new levee covering this point.

Sparta to Duckport (588–590 R.).—Caving in this locality practically ceased during the season; but has worked down to the lower end of the reach, where the levee may be threatened this season.

Reid-Bedford (604–606 R.).—Caving continued with greater activity than ever in this bend along the entire reach. After a topographic and hydrographic survey in July it was decided to undertake revetment construction for the purpose of protecting this stretch of levee.

The condition of the levee line as to height and section is practically the same as given in the last annual report, nearly all the work last year being for the construction of new loops. The levee line and profile are shown on maps numbered 10, 11, 12, and 13, herewith.

After the high water of 1907 had receded, it was decided to adopt a provisional grade of 3.5 feet to 4 feet above the highest water for the standard section, and to add a light topping 1½ feet high, with crown of 2 feet and slopes of 2 to 1. This will require the placing of approximately 6,444,000 cubic yards.

The project for next year's work contemplates enlarging the lowest and weakest levees to the above grade. Estimates for such enlargement of all the levees standing less than 2 feet above the highest water have been made, as follows:

Stations.	Miles below Cairo.	Grade above 1903 high water.	Estimated contents.	Estimated price.	Amount.
		Feet.	*Cub. yards.*	*Cents.*	
360–390	427	4	40,000	25	$10,000
560–620	429	4	55,000	30	16,500
790–910	435	4	110,000	25	27,500
1790–1864	467	4	75,000	25	18,750
1910–1941	468	4	40,000	25	10,000
2050–2155	469	4	100,000	23	23,000
2255–2390	484	3.5	115,000	22	25,300
2390–2522	484	3.5	115,000	25	28,750
3460–3671	506	3.5	235,000	25	58,750
4050–4209	517	3.5	115,000	22	25,300
Total			1,000,000		243,850

The field expenditures in this levee district for the year ending May 1, 1907, amounted to $72,863.37, of which 65.1 per cent was for construction, 4.1 per cent for repairs and maintenance, 2.9 per cent for surveys, 16.4 per cent for high water, and 11.5 per cent for engineering. Cost of engineering is 7 per cent of all the work supervised—that of the levee boards amounting to $49,214.82.

Work in this levee district was under the immediate supervision of Mr. A. M. Todd, assistant engineer. The above report and appended tables include the essential features of his detailed report, which has been filed at this office.

HIGH WATER.

Early in January, 1907, moderate freshets out of the Ohio and Cumberland resulted in a gauge reading of 42.7 feet at Cairo, and caused the filling of the entire lower river to a bank-full stage. After a fall of but 1.8 feet at Cairo the river again began to rise January 16 as a result of moderate to heavy rains over the upper Mississippi and Ohio valleys. A couple of days afterwards it was evident from the condition of the tributaries that a flood was in sight which would approximate in height that of 1903, and might go higher if intervening weather conditions were unfavorable.

Immediate steps were taken to raise low places in the levee by topping, especially below Greenville, where long stretches of the line ranged but from 0 to 1 foot above the 1903 high water. High-water forces were organized, all available steamboats were put in commission, and barges and quarter boats were distributed along the levee at important places where they would be most needed by the local boards or forces under this office.

A high-water organization was effected as follows: The levee line was divided into four sections, with an assistant engineer in charge of each. In cooperation with the levee boards, subdivisions of about 10 miles were put in charge of competent foremen for the patrolling of the line and the execution of the necessary work. Moderate amounts of materials, such as sacks, lumber, and tools, were purchased and distributed, and arrangements were made for immediate delivery of additional materials should they become necessary.

By the end of January a great deal of the low levee had been topped, and plans were perfected for combatting a flood 1 foot or more above that of 1903. On February 4 hard freezing weather set in over the upper valleys, the condition of the lower tributaries was satisfactory, and indications generally were in favor of a somewhat lower water than had been provided for. Thereafter work was confined to patrolling the line, strengthening weak sections, sacking wave wash, and treating dangerous sand boils. The crest was reached at Vicksburg February 11; by this time active operations had been suspended, though the patrolling force was retained until the fall amounted to 3 feet or more.

Compared with the 1903 water this flood averaged about 1 foot lower in the third district. There were, however, marked departures from parallelism, notably at mouth of White River, where it was 1.8 feet below; at Greenville, where the same difference obtained; at Lake Providence, where it was only 0.2 foot lower, and at Vicksburg, where it was 2.1 feet below. The sag in front of both overflow basins was plainly due to the rapid rate of rise and fall, the flood being of short duration, and to the comparatively low discharge of the tributaries which contributed but little to fill the basins, resulting in the abstraction of large volumes from the main river. The apparent depression of this flood below that of 1903 at Greenville amounted to about 0.9 foot, and is to be attributed to the construction of the dike on Leland Neck, where, in 1903, an enormous cross flow produced a cut-off effect. This depression is marked down as far as Pilchers Point. From Wilsons Point to lower Point Lookout a remarkable elevation of the flood plane was evident. That it resulted from some change of regimen is shown by a study of the Greenville-Lake Providence gauge relation, which demonstrates that it was in effect from a 25-foot stage up.

Flood expenditures, including steamboats, topping, supervision, and all other expenses, were as follows:

Lower Yazoo levee district:	
By the United States	$25,006.98
By the levee board	34,133.66
Upper Tensas levee district:	
By the United States	12,750.27
By the levee boards	10,263.09

About 25 per cent of the amounts expended under this office was for steamboats, which served the levee-board forces as well as our own.

The following table gives the maximum gauge readings for the years 1897 to 1907, inclusive, arranged in the order of relative heights of the floods:

Location.	Height.	Year.	Location.	Height.	Year.
Cairo	51.6	1897	Arkansas City	52.9	1903
	50.6	1903		52.1	1907
	50.3	1907		51.9	1897
	49.8	1898		51.1	1898
	49.1	1904		50.0	1906
	46.9	1906		49.0	1904
	46.2	1899		48.6	1899
	43.2	1901		43.3	1901
	42.2	1902		41.1	1902
	39.2	1900		39.8	1905
	38.4	1905		39.2	1900
Memphis	40.2	1907	Greenville	49.1	1903
	40.1	1903		47.3	1907
	39.2	1904		46.8	1897
	37.8	1897		46.2	1898
	37.6	1898		44.9	1906
	37.0	1906		43.6	1904
	35.2	1899		43.0	1899
	32.1	1901		37.4	1901
	30.9	1902		36.1	1902
	29.5	1900		33.9	1905
	29.0	1905		33.3	1900
Helena	51.8	1897	Lake Providence	46.5	1903
	51.0	1903		46.3	1907
	50.4	1907		44.4	1897
	49.1	1898		44.4	1898
	47.6	1904		43.7	1906
	47.0	1906		42.5	1904
	46.8	1899		41.7	1899
	41.5	1901		36.5	1901
	39.6	1902		35.0	1902
	38.3	1900		33.5	1905
	37.0	1905		33.0	1900
Mouth White River	53.7	1903	Vicksburg	52.4	1897
	52.4	1897		51.8	1903
	51.9	1907		49.7	1907
	51.1	1898		49.4	1898
	49.8	1906		47.3	1899
	49.5	1904		47.2	1906
	48.5	1899		46.9	1904
	44.7	1901		44.5	1901
	43.3	1902		41.2	1902
	41.2	1905		38.0	1900
	40.9	1900		37.7	1905

The levees held well, no marked weakness developing anywhere. Those in Arkansas and Louisiana without banquette gave, on the whole, less trouble and involved less expense than those in Mississippi which, generally, have banquettes.

But little damage to the levees was done during the flood; some of the new work was wave-washed where exposed and on a few stretches where material was not available, the corner of the banquette was robbed for topping. At the end of Leland Dike, large areas were scalped, new holes were washed out and old ones greatly enlarged.

A second rise, principally out of the Ohio, culminated in this district April 5–9, with crest 4.2 to 5.4 feet below that of February. No high-water maintenance was necessary during the second rise.

Levee work generally.—With the completion of the existing contracts, the levees of the Third District will have a grade generally from 2 to 3 feet above the highest water—about half of the lines having the lower elevation, with a number of long stretches reduced in section to 4 and 6 foot crown and 2 to 1 front slopes and with a few short sections raised to the grade by light topping. As the 2-foot provisional grade heretofore adopted would by this work be practically attained, it became important that another standard be set to guide in future work. Report was made to the Commission, dated March 13, 1907, in which, after considering the questions of minimum practicable enlargement and ultimate enlargement, it was recommended that an intermediate enlargement be adopted as being best adapted to economical prosecution of the work and to covering the entire line within a reasonable period. The report was approved and a new provisional grade adopted "not exceeding 4 feet above the high water of 1903" for the standard section, thus permitting enlargement to a lower grade of 3 or 3½ feet for sections where later floods indicated a depression in the high-water slope. A proposed light topping 1½

feet higher than the grades provided for the standard section was also approved and has now been included in the specifications. To complete the levees in this district to the new provisional grade will require the placing of about 7,000,000 cubic yards in the Lower Yazoo district and about 6,000,000 cubic yards in the Upper Tensas district. If new loops of great extent and number can be avoided, the programme should be completed in five or six years. Recommendations in the report "that banquette work be limited to levees of steep back slope and levees which during floods have been shown to be weak," and "that new loops be undertaken only after thorough study of each situation, including a hydrographic survey of the reach; and after approval of the relocation has been rendered by the Commission" were also approved.

Study of the difficult levee situation at the upper end of the Upper Tensas basin is being made, and a special report thereon will be submitted. Between the Arkansas River levees and the Mississippi River levees there is a gap of 4½ miles, and large areas of rich land are thereby subjected to overflow. The floods of 1897, 1898, 1903, and 1907 flanked the end of the main line at Costellos gin and poured great volumes of water into the basin below. In 1903, 171 square miles were overflowed above the Amos Bayou divide, which extends west from Costellos gin; and 483 square miles were overflowed below the divide—all due to the gap between the two systems. The lower area could be protected by a low levee along the divide, at a cost of $70,000; but the right of way is controlled by people interested in the lands between the two levee systems, and they have resisted, in the courts and in every possible way, the construction of this low levee, which would be of incalculable benefit to the lands below—hoping thereby to force a junction of the Arkansas and Mississippi levees. For the levee to accomplish this, about $150,000, in addition to $102,000 already allotted for an extension of the Arkansas line would be required; but such a solution is impracticable until provision has been made for diverting the large flow of Cypress Creek through the bayous below, which drain finally into Red River. An extensive drainage system is involved, as some of the bayous which formerly emptied into the Mississippi are now dammed by the main levee and have no adequate connection with the inland streams; and all of the bayous are choked with logs, drift, growing timber, and deposit. It is recognized that the Commission has heretofore been opposed to taking up any questions of drainage; but this would seem to be an exceptional case, being so closely allied to the protection of great areas from overflow, in view of which it may be deemed advisable to undertake a survey for the determination of the data necessary to decide as to the best means and cost of opening up these streams, so that eventually the gap in the levee may be closed and more than 400,000 acres of the richest alluvial lands be reclaimed from overflow.

Appended to this report are fifteen statements of details. Maps,[a] numbered from 1 to 13, inclusive, and referred to above, are herewith.

Money statements, abstracts of contracts in force, abstracts of proposals, list of civilian engineers, and apportionment of cost and deterioration of plant (called for by resolution of the Commission, Proceedings, p. 1099) will be forwarded July 1.

Very respectfully, your obedient servant, G. M. HOFFMAN,
Captain, Corps of Engineers.

Col. CLINTON B. SEARS,
Corps of Engineers, President Mississippi River Commission.

STATEMENT No. 1.—*Lake Bolivar front.*

Statement of work done.	Cost.	Per cent.
136 squares of pocket mat, at $9.97+	$1,356.39	18.04
1,046 linear feet of bank graded by machine, at $0.57+	597.63	7.95
486 squares bank paving (riprap), at $5.73+	2,785.25	37.05
52 squares bank paving (spalls), at $5.81+	302.40	4.02
275 linear feet of bank graded by hand, at $0.84+	231.31	3.08
329 linear feet of bank stripped, at $0.90−	295.30	3.93
1,741 cubic yards of stone loaded, at $0.45+	784.47	10.43
2.5 acres of bank cleared, at $82.68−	206.69	2.75
Supervision	318.97	4.24
Property purchased	102.60	1.37
Engineer office charges	143.26	1.90
Miscellaneous charges	394.02	5.24
Total	7,518.29	100.00

[a] Not printed.

STATEMENT No. 2.—*Ashbrook Neck.*

Statement of work done.	Cost.	Per cent.
3,760 squares of channel mat, at $6.26−	$23,534.56	55.07
842 squares of pocket mat, at $7.48−	6,294.58	14.73
570 squares bank paved (spalls), at $4.26−	2,429.15	5.68
86 squares bank paved (riprap), at $6.50−	558.88	1.31
1,060 linear feet bank graded (hydraulic), at $1.15+	1,220.30	2.86
670 linear feet slope dressed, at $0.28+	189.50	.44
19.5 acres bank cleared, at $27.70+	540.16	1.26
600 cubic yards stone loaded, at $0.25+	150.52	.35
79 days' towing, at $53.92+	4,261.08	9.97
Supervision	1,509.38	3.53
Surveys	113.89	.27
Miscellaneous charges	677.31	1.59
Property purchased	982.95	2.30
Engineer office charges	275.20	.64
Total	42,737.26	100.00

STATEMENT No. 3.—*Greenville Harbor.*

Statement of work done.	Cost.	Per cent.
1,194 squares of channel mat, at $6.91−	$8,245.29	51.15
91 squares of pocket mat, at $5.65−	513.93	3.19
615 squares bank paved (riprap), at $5.07+	3,120.08	19.36
110 squares bank paved (spalls), at $3.66−	402.50	2.50
900 cubic yards dirt moved, at $0.11+	100.15	.62
450 linear feet slope dressed, at $0.55+	248.40	1.54
22 days' towing, at $46.89−	1,031.52	6.40
Supervision	467.61	2.90
Surveys	56.94	.35
Digging drains to borrow pits	83.87	.52
Property purchased	299.05	1.86
Miscellaneous charges	376.04	2.33
Engineer office charges	337.50	2.09
Total	16,120.24	100.00

STATEMENT No 4.—*Lake Providence.*

Statement of work done.	Cost.	Per cent.
1,907 squares of channel mat, at $7.53+	$14,361.84	54.86
680 squares of pocket mat, at $7.40−	5,030.05	19.21
7.75 acres of bank cleared, at $25.30+	195.99	.75
47 days' towing, at $48.22−	2,266.33	8.66
Supervision	1,238.85	4.73
Property purchased	879.94	3.36
Miscellaneous charges	1,484.35	5.67
Engineer office charges	723.32	2.76
Total	26,180.67	100.00

STATEMENT No. 5.—*Reid-Bedford Bend.*

Statement of work done.	Cost.	Per cent.
7,389 squares channel mat, at $8.81−	$65,078.25	77.34
312 squares connecting mat, at $8.26+	2,577.53	3.06
30,532 cubic yards hydraulic grading, at 4.034 cents per cubic yard	1,231.62	1.46
13 acres of bank cleared, at $66.71	867.21	1.03
Towing	6,322.43	7.51
Supervision	2,381.17	2.83
Care and repairs to plant	3,059.25	3.84
Transportation	2,058.33	2.45
Engineer office charges	568.10	.68
Total	84,144.89	100.00

STATEMENT No. 6.—*Final report of operations, May 1, 1905, to July 31, 1906.*

STONE.

Amount expended as per financial statement	$30,008.26
Outstanding liabilities	206.95
Material on hand at beginning of season	433.88
Material received from plant	910.68
Total	31,559.77

Accounted for as follows:	
Material, etc., transferred to plant	1,618.61
Material, etc., transferred to levees	17.45
Material on hand at close of season	396.72
Amount expended in quarrying	15,988.30
Amount expended in towing	10,603.11
Amount expended in unloading	2,935.58
Total	31,559.77

Cost of the various items of quarrying.

Classification.	Cubic yards.	Per cubic yard.	Amount.
Stripping	22,200	$0.1085+	$2,408.73
Drilling	22,200	.1338−	2,969.18
Blasting	18,200	.0540+	982.86
Breaking	15,800	.2062−	3,257.88
Loading	16,813.2	.2763+	4,645.78
Care of quarry	16,813.2	.0267	449.00
Miscellaneous charges	16,813.2	.0329−	552.88
Engineer office charges	16,813.2	.0429+	721.99
Total		.8813	15,988.30

Towing.

Name of boat.	Days.	Cubic yards.	Per cubic yard.	Amount.
Steamer Arthur Hider (double crew)	108	16,434	$0.6452	$10,937.30
Stone lost in towing		379.2	.0203	334.19
Total			.6655	11,271.49

Unloading.

Kind of stone.	Cubic yards.	Per cubic yard.	Amount.
Red River stone	13,018.40		$2,507.18
Barrett stone	1,260.13		242.68
Negus stone	964.40		185.72
Total	15,242.93	$0.19258+	2,935.58

Summary of cost.

Cost per yard to quarry	$0.8813
Cost per yard to tow	.6655
Cost per yard to unload	.1926
Total	1.7394

STATEMENT No. 7.—*Quarrying, towing, and unloading stone.*

Month.	Yards quarried.	Yards towed.	Yards unloaded.	Cost to quarry.	Cost to tow.	Cost to unload.	Total.
January	900	.....	850	$1,198.46	$1,036.61	$300.24	$2,535.31
February	2,200	1,790.9	3,617.2	3,698.63	1,605.10	913.74	6,217.47
March	5,024	4,343.1	3,973.3	4,375.67	3,317.21	1,011.70	8,704.58
April	5,176	6,755.5	5,919.2	4,637.41	2,908.34	1,338.05	8,883.80
Total	13,300	12,889.5	14,359.7	13,910.17	8,867.26	3,563.73	26,341.16

Summary of cost.

Cost per yard to quarry and load	$1.046
Cost per yard to tow	.687
Cost per yard to unload	[a] .248
Total	1.981

STATEMENT No. 8.—*Cost of repairs to plant, May 1, 1906, to April 30, 1907.*

Name or number.	Cost.	Work done.
Steamer Arthur Hider	$2,769.93	New splash bulkhead; roof repaired and painted; new nosing on waterway plank-sheer; guards repaired; new exhaust pipes; scuppers and drain pipes renewed; repairs to steering gear; new smokestacks, and inside cabin painted.
Steamer H. St. L. Coppee	822.27	Ordinary repairs during the year.
Tug Parker	545.35	Repairs to boiler and fire box. Repainted.
Quarter boats:		
No. 17	1,080.83	New gunwales, rakes, guards, head blocks; 4 kevels; all deck beams pieced out; bottom, sides, and deck calked; and minor repairs to cabin.
No. 31	39.66	Minor repairs.
No. 86	32.60	
No. 87	13.80	
No. 88	70.88	New canvass roof.
No 155	22.08	Repairs to roof.
No. 156	23.64	Minor repairs.
No. 157	10.00	
No. 158	22.32	
No. 159	82.71	New canvass roof.
Carpenter shop, No. 78	138.95	Repairs to boiler and band saw.
Machine shop, No. 222	67.07	Minor repairs.
Mat boat No. 28	1,924.90	Half of gunwales new; head blocks pieced out; new rakes and rake pieces; 50 new deck beams; 5 timberheads; 2 kevels; 5 outriggers; 5 skids; brakes and reel frames repaired; bottom, sides, rakes, and deck calked.
Mat boat No. 29	1,569.44	Twenty pieces of gunwale; 14 halfway pieces; 6 rake pieces reenforced; 3 timberheads; 52 deck beams; 2 kevels; 8 stanchions under skids; 2 skids; brakes repaired; bottom, sides, rakes, and decks calked.
Barges:		
No. 111	13.48	Calked above light water.
No. 204 (office)	86.28	Roof repaired and painted.
No. 216	12.50	Minor repairs.
No. 217	13.90	Do.
No. 561	269.81	Sheathed.
No. 563	244.71	Do.
No. 565	6.67	Minor repairs.
No. 567	1,477.19	New top gunwales; 3 pieces of second gunwales; 3 timberheads; new deck and deck frames; head blocks; streamers reenforced; stanchions reset; 20 pieces in rakes; deck, sides, and rakes calked.
No. 571	24.35	Calked above light water.
No. 574	139.54	Repairs not completed.
No. 573	157.32	
No. 576	520.40	
No. 578 (derrick)	106.80	Ordinary repairs during the year.
No. 579	31.55	Minor repairs.
No. 580	37.53	
No. 584	45.04	
No. 583	10.39	
No. 585	231.80	Five pieces of gunwale, 1 rake piece, 1 rake plank, 1 timberhead put in new, and side calked where repaired.
No. 586	32.16	Minor repairs.
No. 589	31.55	Do.

[a] This item includes cost of tug and care of plant at Greenville.

STATEMENT No. 8.—*Cost of repairs to plant, etc.*—Continued.

Name or number.	Cost.	Work done.
Grader No. 1	$1,135.05	New stack, sides and rakes calked, new pump installed and pumphouse built, roof repaired.
Dry dock	300.78	New stack made, braces and beams put under boiler house, sides calked.
Barge pumps	294.63	Patched and new suckers.
Skiffs	36.22	Minor repairs.
Property	208.42	Repairs to stone carts, cooking utensils, (etc.)
Steamer Chisca	72.13	Minor repairs.
Steamer Scimitar II	2,486.48	Docking and towing to Vicksburg, inspection, and changes made in cabin.
Quarter boat No. 2 (Vicksburg district).	119.42	Minor repairs.
Steamer Columbia (Vicksburg district).	96.71	Do.
General repairs	1,108.47	Fitting out boats for service, washing boilers, and care of machinery.
Levees	47.55	High-water spikes.
Surveys	100.12	Sawing stakes, making targets, and getting out wheel material for steamer Thos. B. Florence.
Construction	709.21	Cable clamps, wire twisters, etc., made, and tools repaired.
Wages account	645.34	Supervision necessary to above.
Total	20,089.93	

STATEMENT No. 9.—*List of floating plant belonging to the third district.*

Number or name.	Number of pieces.	Number or name.	Number of pieces.
Steamer Arthur Hider	1	Grader No. 1	1
Steamer H. St. L. Coppee	1	Grader No. 77	1
Steamer Scimitar II	1	Dry dock	1
Tug Parker	1	Skiffs	24
Mattress boats Nos. 28 and 29	2	Boats, calking	5
Headquarter boat No. 31	1	Carpenter shop and outfit	1
Quarter boats	9	Machine shop and outfit	1
Square barges, first class	12	Dredge boat	1
Square barges, second class	10		
Square barges, third class	3	Total number of pieces	77
Pile driver No. 49	1		

STATEMENT No. 10.—*Levee work in lower Yazoo levee district, May 1, 1906, to May 1, 1907.*

Stations.	Miles below Cairo.	Contractors.	Cubic yards in contract.	Cubic yards placed this year.	Total laborers.	Total teams.
720 to 862	378	J. A. Burt	27,854	644	44	28
1038 to 1226	392	Roach & Stansell	141,000	33,711	1,919	1,574
1038, spur	392	do	8,964	8,964	269	231
4025 to 4200	476	do	144,000	69,511	3,510	2,545
1200 to 1375	496	J. K. Jeffries & Son	140,000	21,504	1,536	985
1600 to 1800	503	J. & A. Wynn	40,000	2,312	138	100
1800 to 2000	507	J. B. Lewis	95,000	13,491	634	443
2000 to 2100	513	Lowrance Bros	51,821	51,821	1,818	1,477
2100 to 2200	514	J. B. Lewis	20,000	5,787	397	309
2200 to 2300	516	Lowrance Bros	58,772	58,772	2,851	2,115
2300 to 2440	517	J. B. Lewis	28,000	(a)	(a)	.....
2950 to 3133	534	Donavan & Daley	170,000	(a)	(a)	.....
3238 to 3491	538	J. B. Lewis	146,000	4,531	386	250
3586 to 3700	547	Roach & Stansell	23,000	(a)	(a)	.....
3700 to 3910	550	J. B. Lewis	167,000	11,329	615	449
Topping during high water	.....	.....	.....	23,650	(b)	.....
Total	.....	.....	1,261,411	c306,027	14,617	10,506

[a] Not commenced.
[b] Day force.
[c] Of above yardage in place, 11,103 cubic yards are in false berms and not added to controlling levee.

STATEMENT No. 10.—*Levee work in lower Yazoo levee district, May 1, 1906, to May 1, 1907*—Continued.

Stations.	Miles below Cairo.	Total scrapers.	Yards per team.	Yards per scraper.	Price per cubic yard.	Average height.	Average haul.	Kind of work.
					Cents.	*Feet.*	*Feet.*	
720 to 862	378	17	23	38	27.25	17.0	300	Topping.
1038 to 1226	392	965	21	35	26.00	17.9	185	Enlargement.
1038, spur	392	143	39	63	26.00	17.0	90	Cutting down levee and topping.
4025 to 4200	476	1,535	27	45	19.00	17.0	167	Enlargement.
1200 to 1375	496	594	22	36	18.75	17.1	154	Do.
1600 to 1800	503	61	23	38	26.50	16.8	200	Topping.
1800 to 2000	507	293	30	46	21.00	16.0	211	Enlargement.
2000 to 2100	513	969	35	53	19.89	13.1	177	Do.
2100 to 2200	514	203	19	29	28.00	15.1	286	Topping.
2200 to 2300	516	1,300	28	45	19.89	13.6	192	Enlargement.
2300 to 2440	517	.....	.....	.....	28.00	.....	.....	Topping.
2950 to 3133	534	.....	.....	.....	20.9	.....	.....	Enlargement.
3238 to 3491	538	197	18	23	19.9	13.7	600	Do.
3586 to 3700	547	.....	.....	.....	35.00	.....	.....	Topping.
3700 to 3910	550	285	25	40	22.00	13.3	242	Enlargement.
Total	.....	6,562	27	43	20.88	17.1	189	

STATEMENT No. 11.—*Levee construction by the Mississippi levee board from May 1, 1906, to April 15, 1907.*

Stations.	Miles below Cairo.	Cubic yards placed.	Price per cubic yard.	Total expended.	Kind of work.
Above Greenville:			*Cents.*		
450 to 720	376	46,127	22 and 25	[a] $9,907.66	Topping and banquette.
3790	458	15,997	26	4,159.22	Spur dike.
3885	460	11,401	29	[a] 2,810.35	Do.
3980 to 4021	476	95,274	25	12,543.25	Enlargement and new levee.
3971 to 4021	476	65,506	20.50	[a] 16,601.50	New levee.
4260	478	1,383	(b)	779.05	Road-crossing repairs.
Below Greenville:					
600 to 620	492	7,239	(b)	2,291.50	Repair work.
1370 to 1480	501	32,028	30 and 28.50	[a] 8,116.37	Banquette.
1375 to 1480	501	83,475	27.90	[a] 19,796.09	Enlargement.
2100 to 2120	514	8,281	22	[a] 1,548.55	Repair work.
2617 to 2780	531	95,214	26 and 24.50	[a] 20,890.40	Enlargement.
2780 to 2950	533	85,132	26 and 24.50	[a] 18,739.94	Do.
3956 to 4026	552	39,007	28.70	[a] 9,515.76	Do.
4258 to 4670	560	18,202	34	[a] 5,260.38	Topping.
5160 to 5232	572	29,352	23 and 21.50	[a] 5,589.84	Enlargement.
		3,000	.....	.....	Topping.
Total	.....	636,618	.....	[c] 138,549.86	

[a] Retained 15 per cent not included.
[b] Day force.
[c] Does not include $28,351.98 expended for rights of way for levee board and United States, $34,133.66 for high-water protection, and $917.99 for weed cutting.

Of the total yardage placed, 16,903 cubic yards were expended in repairs and false berms and not included in yardage added to levees during the year.

Engineering and inspection not included in above.

STATEMENT No. 12.—*Rainfall, in inches, at Greenville, Miss., May 1, 1906, to April 30, 1907.*

	1906.								1907.				
	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total.
Rainfall	5.86	1.61	5.61	2.25	8.62	3.40	8.30	5.47	2.50	3.55	5.65	5.41	58.03
Mean for 20 years	3.62	4.02	4.23	3.69	2.74	1.93	3.66	4.24	4.96	4.26	5.79	4.09	47.23

STATEMENT No. 13.—*Levee work in upper Tensas levee district, May 1, 1906, to May 1, 1907.*

Stations.	Miles below Cairo.	Contractors.	Cubic yards in contract.	Cubic yards placed during year.	Total laborers.	Total teams.
783 to 833	Ark. R.	McCadden, Morgan & Co.	178,883	(a)	(a)	(a)
833 to 883	Ark. R.	do	168,000	(a)	(a)	(a)
883 to 926	Ark. R.	do	175,000	(a)	(a)	(a)
620 to 699	431	J. B. Lewis	125,000	37,263	1,606	1,409
1625 to 1720	450	Donovan & Daley	73,249	11,413	573	421
1720 to 1790	451	Lowrance Bros.	97,000	(b)	(b)	(b)
2850 to 3100	493	J. K. Jeffries & Son	132,727	9,770	656	472
3671 to 3762a	508	J. B. Lewis	257,862	114,198	4,743	3,732
3671 to 3762a	508	do	32,863	32,863	1,581	1,373
3037 to 3054a	678	Robt. Nicholson	55,000	34,165	2,011	1,653
Total			1,295,584	239,672		

Stations.	Miles below Cairo.	Total scrapers.	Yards per team.	Yards per scraper.	Price per cubic yard.	Average height.	Average haul.	Kind of work.
					Cents.	*Feet.*	*Feet.*	
783 to 883	Ark. R.				19.5	17.2		New work.
833 to 883	Ark. R.				19.5	16.6		Do.
883 to 926	Ark. R.				19.5	17.5		Do.
620 to 699	431	c 683	26	41	24.0	17.0	250	Do.
1625 to 1720	450	384	27	30	27.9	19.1	400	Enlargement.
1720 to 1790	451	(b)	(b)	(b)	34.2	19.0		Do.
2850 to 3100	493	333	21	29	19.5	15.3	450	Do.
3671 to 3762a	508	2,594	31	44	18.9	15.5	250	New work.
3671 to 3762a	508	917	24	36	23.0	15.5	350	Do.
3037 to 3054a	678	1,115	20	31	23.91	15.5	275	Do.

[a] No work during period.
[b] Work not commenced.
[c] One hundred and eleven dump wagons used, operated with 3 mules, estimated to equal 2 scrapers each.

STATEMENT No. 14.—*Levee construction by the levee boards in Arkansas and Louisiana from May 1, 1906, to May 1, 1907.*

CHICOT LEVEE BOARD.

Stations.	Miles below Cairo.	Cubic yards in contract.	Cubic yards placed during year.	Price per cubic yard.	Total expended.	Kind of work.
				Cents.		
3740 to 3758a	508	63,492	8,719	18.9	$1,207.71	New work. [a]

TENSAS BASIN LEVEE BOARD.

650 to 699	431	245,000	42,692	24.0	9,180.86	New work. [a]
2562 to 2850	487	138,454	125,366	23.9	30,275.28	Enlargement.
3100 to 3350	496	115,755	32,598	20.9	8,550.97	Do.

FIFTH LOUISIANA LEVEE DISTRICT.

2497 to 2753	565	299,233	101,000	26.9	21,735.20	Enlargement.
2497 to 2753	565	11,441	11,441	26.9	3,077.63	New work. [b]
3535 to 3567	585	9,578	9,578	21.0	2,011.38	Enlargement.

[a] Part of this new levee also under contract by the United States. (See statement of United States work.)
[b] Emergency loop.

STATEMENT No. 14.—*Levee construction by the levee boards in Arkansas and Louisiana from May 1, 1906, to May 1, 1907*—Continued.

BOARD OF STATE ENGINEERS OF LOUISIANA.

Stations.	Miles below Cairo.	Cubic yards in contract.	Cubic yards placed during year.	Price per cubic yard.	Total expended.	Kind of work.
				Cents.		
1060 to 1136	535	53,443	16,019	17.45	2,236.25	Enlargement; new work.
1127 to 1190	536	57,379	12,199	15.45	1,507.80	Enlargement.
1190 to 1262	537	48,359	1,220	15.45	150.78	Do.
1540 to 1810	545	200,000	.....	25.0	.....	Do.
3291 to 3330	581	136,750	.....	17.75	.....	New work.

SUMMARY.

	Cubic yards in contract.	Cubic yards placed during year.	Total expended.
In Arkansas	562,701	209,375	$49,214.82
In Louisiana	816,183	151,457	30,719.04
Grand total	1,378,884	360,832	79,933.86

STATEMENT No. 15.—*Repair work on levees in upper Tensas levee district.*

Location (stations).	Nature of work.	Number of stations repaired.	Cost.	Cost per unit.
Arkansas River:				
213 to 467	Rain and wave wash repaired, redressed, and resodded.	77	$379.25	$4.93
In Arkansas:				
997 to 1020	Removing drift, and resodding	23	31.05	1.25
1605 to 1625	Heavy rain wash refilled, dressed, and sodded.	20	262.00	13.10
1625 to 2300	Removing drift, and resodding below water line.	139	84.25	6.06
Leland dike	Repairing end and building revetment around end.	.....	808.81	.....
2533 to 2562	Topping with day force [a]	.....	972.75	.534
In Louisiana, various localities.	Removing drift from levee	965	203.95	.211
Total		.....	2,742.06	.....

[a] 1,817 cubic yards.

FINANCIAL STATEMENT.

Appropriation for improving Mississippi River, third district.

LAKE BOLIVAR FRONT.

July 1, 1906, balance unexpended	$2,128.15
Amount allotted from appropriations for improving Mississippi River, acts June 30, 1906, and March 2, 1907	45,000.00
	47,128.15
June 30, 1907, amount expended during fiscal year	8,586.39
July 1, 1907, balance unexpended	38,541.76
July 1, 1907, outstanding liabilities	265.00
July 1, 1907, balance available	38,276.76
Amount that can be profitably expended during fiscal year ending June 30, 1909	30,000.00

ASHBROOK NECK.

July 1, 1906, balance unexpended	$23,956.87
Amount allotted from appropriation for improving Mississippi River, act June 30, 1906	15,000.00
	38,956.87
June 30, 1907, amount expended during fiscal year	38,956.87
Amount that can be profitably expended during fiscal year ending June 30, 1909	70,000.00

GREENVILLE, MISS.

July 1, 1906, balance unexpended	$908.55
Amount allotted from appropriation for improving Mississippi River, act June 30, 1906	15,000.00
	15,908.55
June 30, 1907, amount expended during fiscal year	13,620.62
July 1, 1907, balance unexpended	2,287.93
July 1, 1907, outstanding liabilities	500.00
July 1, 1907, balance available	1,787.93
Amount that can be profitably expended during fiscal year ending June 30, 1909	30,000.00

LONGWOOD, MISS.

July 1, 1906, balance unexpended	$28,869.94
June 30, 1907, amount expended during fiscal year	826.87
July 1, 1907, balance unexpended	28,043.07
July 1, 1907, outstanding liabilities	100.00
July 1, 1907, balance available	27,943.07
Amount that can be profitably expended during fiscal year ending June 30, 1909	10,000.00

LAKE PROVIDENCE REACH.

July 1, 1906, balance unexpended	$28,391.39
Amount allotted from appropriation for improving Mississippi River, act March 2, 1907	25,000.00
	53,391.39
June 30, 1907, amount expended during fiscal year	19,721.11
July 1, 1907, balance unexpended	33,670.28
July 1, 1907, outstanding liabilities	150.00
July 1, 1907, balance available	33,520.28
Amount that can be profitably expended during fiscal year ending June 30, 1909	30,000.00

REPAIRS TO REVETMENT AT LAKE PROVIDENCE AND GENERAL REPAIRS, INCLUDING QUARRYING OF STONE.

July 1, 1906, balance unexpended		$18,325.06
June 30, 1907, amount expended during fiscal year, account different works, as follows:		
Lake Boliver front	$616.95	
Ashbrooke neck	2,624.59	
Lake Providence reach	14,987.98	
Fitlers Bend	47.77	
Reid-Bedford Bend	47.77	
		18,325.06
Amount that can be profitably expended during fiscal year ending June 30, 1909		30,000.00

GENERAL REPAIRS TO EXISTING WORKS.

Amount allotted from appropriation for improving Mississippi River, act March 2, 1907	$30,000.00
July 1, 1907, balance unexpended and available	30,000.00

FITLERS BEND.

Amount allotted from appropriation for improving Mississippi River, act June 30, 1906	$97,500.00
June 30, 1907, amount expended during fiscal year	5,519.29
July 1, 1907, balance unexpended and available	91,980.71
July 1, 1907, amount covered by uncompleted contracts	12,200.00
Amount that can be profitably expended during fiscal year ending June 30, 1909	50,000.00

REID-BEDFORD BEND.

Amounts allotted from appropriations for improving Mississippi River, acts June 30, 1906, and March 2, 1907	$190,000.00
June 30, 1907, amount expended during fiscal year	86,165.88
July 1, 1907, balance unexpended and available	103,834.12
July 1, 1907, amount covered by uncompleted contracts	5,500.00
Amount that can be profitably expended during fiscal year ending June 30, 1909	50,000.00

STONE, THIRD DISTRICT.

July 1, 1906, balance unexpended	$2,133.71
Amounts allotted from appropriations for improving Mississippi River, acts June 30, 1906, and March 2, 1907	80,000.00
	82,133.71
June 30, 1907, amount expended during fiscal year	42,133.71
July 1, 1907, balance unexpended and available	40,000.00
Amount that can be profitably expended during fiscal year ending June 30, 1909	50,000.00

PLANT, THIRD DISTRICT.

July 1, 1906, balance unexpended	$458.68
Amounts allotted from appropriations for improving Mississippi River, acts June 30, 1906, and March 2, 1907	210,000.00
	210,458.68
June 30, 1907, amount expended during fiscal year	61,044.88
July 1, 1907, balance unexpended	149,413.80
July 1, 1907, outstanding liabilities	11,000.00
July 1, 1907, balance available	138,413.80
July 1, 1907, amount covered by uncompleted contracts	76,000.00
Amount that can be profitably expended during fiscal year ending June 30, 1909	50,000.00

SURVEYS, THIRD DISTRICT.

Amounts allotted from appropriations for improving Mississippi River, acts June 30, 1906, and March 2, 1907	$15,000.00
June 30, 1907, amount expended during fiscal year	5,000.00
July 1, 1907, balance unexpended and available	10,000.00
Amount that can be profitably expended during fiscal year ending June 30, 1909	7,500.00

LOWER YAZOO LEVEE DISTRICT.

July 1, 1906, balance unexpended	$107,862.23
Amounts allotted from appropriations for improving Mississippi River, acts June 30, 1906, and March 2, 1907	385,000.00
	492,862.23
June 30, 1907, amount expended during fiscal year	89,657.34
July 1, 1907, balance unexpended	403,204.89
July 1, 1907, outstanding liabilities	1,500.00
July 1, 1907, balance available	401,704.89
July 1, 1907, amount covered by uncompleted contracts	270,000.00
Amount that can be profitably expended during fiscal year ending June 30, 1909	300,000.00

UPPER TENSAS LEVEE DISTRICT.

July 1, 1906, balance unexpended	$80,323.99
Amounts allotted from appropriations for improving Mississippi River, acts June 30, 1906, and March 2, 1907	390,000.00
	470,323.99
June 30, 1907, amount expended during fiscal year	78,984.99
July 1, 1907, balance unexpended	391,339.00
July 1, 1907, outstanding liabilities	2,500.00
July 1, 1907, balance available	388,839.00
July 1, 1907, amount covered by uncompleted contracts	281,000.00
Amount that can be profitably expended during fiscal year ending June 30, 1909	300,000.00

Abstract of contracts in force June 30, 1907.

LEVEE WORK.

Name of contractor.	Amount and character of work or material.	Unit price.	Date of approval.	Date of beginning.	Date of expiration.
	Cu. yds.	*Cents.*			
McCadden, Morgan & Co	521,900	19.5	Sept. 12, 1904	Sept. 8, 1904	[a] Mar. 1, 1905
J. B. Lewis	125,000	24	Oct. 9, 1906	Sept. 3, 1906	Jan. 1, 1908
	30,000	30	do	do	do
Do	258,000	18.9	do	Nov. 1, 1906	do
	30,000	23	do	do	do
Robert Nicholson	55,000	23.91	do	Oct. 10, 1906	[a] Feb. 1, 1907
Lowrance Bros	97,000	34.2	Nov. 7, 1904	([b])	Jan. 1, 1908
Roach & Stansell	130,000	24.7	June 6, 1907	June 10, 1907	do
Do	95,000	33	do	([b])	Jan. 1, 1909
Do	40,000	28	do	([b])	do
W. T. Lowrance	145,000	25.9	June 12, 1907	May 17, 1907	Jan. 1, 1908
Do	75,000	24.9	do	([b])	Jan. 1, 1909
Roach & Stansell	141,000	26	Dec. 29, 1905	Aug. 13, 1906	[a] Dec. 31, 1906
J. B. Lewis	95,000	21	Oct. 9, 1906	Oct. 8, 1906	Jan. 1, 1908
Do	48,000	28	do	Jan. 1, 1907	do
Do	146,000	19.9	do	Mar. 4, 1907	do
Do	167,000	22	do	Dec. 13, 1906	do
Donovan & Daley	170,000	20.9	do	([b])	do
Roach & Stansell	23,000	35	Oct. 10, 1906	([b])	do
Do	432,000	24.7	June 6, 1907	June 7, 1907	Jan. 1, 1909

[a] Time limit waived. [b] Work not commenced.

Abstract of contracts in force June 30, 1907—Continued.

FOUR MATERIAL BARGES.

Name of contractor.	Amount and character of work or material.	Unit price.	Date of approval.	Date of beginning.	Date of expiration.
Oscar F. Barrett	.....	$3,972	Mar. 2, 1907	May 20, 1907	Sept. 6, 1907

TWO MAT BARGES.

Howard Ship Yards Co.	.....	$6,956	(a)	May 22, 1907	Aug. 23, 1907

BRUSH AND POLES.

C. W. Hunter	*Cords.* 25,000	$1.22	(a)	Oct. 16, 1906	Indefinite.

[a] Emergency contract.

Data of cost of revetment, May 1, 1906, to May 1, 1907.

[Submitted in compliance with resolution of Mississippi River Commission.]

Revetment.	Expended as per financial statement.	Debits, to material transferred from reserve, retained percentages, etc.	Credits, by material transferred to reserve, etc.	Cost of work.				
				Construction.	Repairs.	Surveys.	Care, repairs, and deterioration of plant.	Total.
Lake Bolivar Front	$6,961.53 a 1,391.95	$3,098.72	$3,933.91	.....	$7,518.29	$289.37	$2,457.04	$10,264.70
Ashbrook Neck	38,802.81 a 2,624.59	4,748.53	3,438.67	.....	42,737.26	837.56	8,446.49	52,021.31
Greenville, Miss	11,785.07	5,466.64	1,131.47	.....	16,120.24	986.32	7,769.81	24,876.37
Longwood, Miss	826.87	.....	806.62	$20.25	.....	342.35	2,340.88	2,703.48
Lake Providence	18,974.24 a 14,987.98	4,313.62	12,095.17	.....	26,180.67	1,027.09	8,688.70	35,896.46
Fitlers Bend	5,519.29 a 47.77	.....	5,490.49	76.57	.....	.....	.....	76.57
Reid-Bedford Bend	84,828.74 a 47.77	19,706.75	8,275.45	96,307.81	.....	179.32	6,038.23	102,525.36
Louisiana Bend	.....	.....	.....	.....	.....	921.10	6,298.07	7,219.17
Delta Point	.....	.....	.....	.....	.....	480.93	3,288.38	3,769.31
Total	186,798.61	37,334.26	35,171.78	96,404.63	92,556.46	5,064.04	45,327.60	239,352.73

[a] Amounts chargeable to this work from allotment for "Repairs to revetment at Lake Providence, and general repairs, including quarrying of stone."

APPENDIX 4.

REPORT OF CAPT. J. F. M'INDOE, CORPS OF ENGINEERS, ON OPERATIONS IN THE FOURTH DISTRICT.

MISSISSIPPI RIVER COMMISSION, FOURTH DISTRICT,
New Orleans, La., June 1, 1907.

COLONEL: I have the honor to submit the following report upon the work of the fourth district, Mississippi River improvement, for the period from June 1, 1906, to June 1, 1907:

The fourth district extends from Warrenton, Miss., 7½ miles below Vicksburg, Miss., to the Head of the Passes, about 13 miles from the Gulf of Mexico, a distance of 452.8 miles by river.

The works include bank protection in Bondurant Chute, bank protection in Kempe Bend, the improvement of the harbors at Natchez, Miss., and Vidalia, La., improvements at the junction of the Mississippi, Red, and Atchafalaya rivers, improvement of the harbor at New Orleans, La., and the construction, repair, and maintenance of the levee system of the district.

1. BONDURANT CHUTE REVETMENT.

For history of this work, project, and details of its execution, see current summary; also annual reports of the Chief of Engineers since 1901.

At the beginning of the year the length of the revetment measured parallel to the general shore line was 2,440 feet.

On the subsidence of the high water of 1906 the concrete-in-situ upper bank pavement at the lower end of the revetment was found to be in bad condition and the bank line for some distance below had caved back over 100 feet, threatening the integrity of the controlling levee line at a point about 700 feet below the revetment. Owing to the excessive saturation of the bank, due to seepage from Lake Bruen, the concrete upper bank pavement had been broken up at several places along the line of the old revetment.

The work contemplated for the past season was to extend the revetment downstream to cover the point where the levee was threatened and to make the necessary repairs to the upper bank pavement along the old work.

As Bondurant Chute is not navigable, even for light-draft boats, below a 22-foot stage on the Vicksburg gauge, it is necessary to have rock and spalls for upper bank paving boated into the chute during high water and unloaded on the bank for use when the river falls to a suitable stage. This entails one extra handling and increases the cost of upper bank paving at this locality.

On August 15 operations commenced with a small force engaged in filling up washouts and regrading the bank along the lower end of the revetment where the upper bank pavement had been injured or destroyed by the high water of 1906. On account of the low stage of the river the chute was closed to navigation, and *Grader No. 5*, used as quarters for the repair force, had to be moored in the Mississippi River near the head of the chute. Repair work was suspended September 14 and the *Grader* transferred to Kempe Bend. On October 17 a rise in the river enabled the quarter boat *Gamma* and several barges of rock and spalls to be towed into the chute, where the materials for most of the repair work were unloaded on the bank at convenient places. The river having commenced to fall, the *Gamma* and other plant were returned to Kempe Bend October 27. In the latter part of November the river again commenced to rise, attaining a height of 37 feet on the Vicksburg gauge. On November 29 the plant was returned to Bondurant, and the mattresses, which had been previously built at Big Black Island bar, were floated into the chute and sunk in extension of the revetment downstream. Sufficient rock and spalls to pave the bank along the extension of the revetment were unloaded on the bank and the sinking plant again returned to Kempe Bend on December 15. *Grader No. 5* was moved into the chute on December 11 and completed the grading of the upper bank along the new mattress work by December 20. The *Grader* was retained in the chute until January 9 as headquarters for a small force engaged in paving the upper bank and unloading spalls. On January 9 the river had reached so high a stage that all work had to be suspended. The work done consisted in the placing of 120,000 square feet of mattress, the grading of 1,100 linear feet of bank, and the repair and paving with rock and spawls of 11,173 square feet of upper bank.

Mattress construction.—The mattress for Bondurant revetment were built on the bar at Big Black Island at a point where they would float off when the river reached a stage of 26 feet at Vicksburg. Details of cost and construction are given in report on Giles Bend revetment. There were 120,000 square feet of mattress built for Bondurant at a cost of $3,605.71.

Towing mattresses.—The mattresses were towed a distance of about 25 miles downstream, and the cost of this was:

Tug *Marengo*, 6 days, at $24	$144
Steamer *Tensas*, 2 days, at $23	46
Total	190
Square feet of mattresses towed	120,000
Cost per square foot for towing	$0.00158

Sinking mattresses.—The mattresses were made in sections 100 by 120 feet and were sunk as near as possible with their inshore edge along a contour corresponding to a stage of 20 feet on the Vicksburg gauge. They extended out into the channel about 100 feet, except the last two mattresses at the upper end, which were 150 feet wide. The rock used for ballast was loaded from a supply on the bank in Kempe Bend, and the cost of loading and towing is included in the cost of sinking, the details of which were:

Steamers and tugs	$437.00
Lumber, wire, wire nails, etc	45.40
812 tons of rock, at $2	1,624.00
Miscellaneous	16.11
Provisions	283.77
Pay rolls	1,031.22
Total	3,437.50
Square feet of mattress sunk	120,000
Cost per square foot to sink	$0.02864

Cost of mattress in place:	
Constructing mattresses	$0.03005
Towing mattresses	.00158
Sinking mattresses	.02864
Cost per square foot in place	.06027

Grading upper bank.—The grading necessary for repair work was done by hand. The grading of the upper bank along the new subaqueous work placed this season was done by *Grader No. 5*. The area graded by hand was 39,619 square feet, and 1,100 linear feet of bank was graded by the hydraulic machine. Cost of this work was:

Grading for repair work by hand	$707.73
New work by hydraulic grader	727.61
Total	1,435.34

Paving.—On a foundation of spalls 2 to 3 inches thick a layer of rock 7 to 8 inches thick was laid by hand. Repairs were made to 39,619 square feet of old pavement, and 11,173 square feet of new pavement was laid along the extension of the revetment. The continued high stage of the river prevented the completion of this latter work. Cost and details are as follows:

Steamers and tugs	$301.00
750 tons spalls, at $2.05	1,537.50
660 tons rock, at $2	1,320.00
Loading and towing 736 tons rock from bank in Kempe Bend	390.08
Miscellaneous	16.11
Provisions	444.12
Pay rolls	1,680.74
Total	5,689.55
Total square feet of pavement laid	50,792
Cost per square foot laid	$0.112

About 720 tons of rock and 823 tons of spalls were unloaded on the bank for paving, but on account of the continued high stage of the river could not be used this season. The cost of towing this material from Giles and Kempe bends to Bondurant and unloading on the bank was $686.59.

Installation.—As work can be carried on in Bondurant Chute only at certain stages of the river, and frequent fluctuations occurred, several expensive installations were necessary, amounting to $877.

The total cost of the work done in Bondurant Chute from May 1, 1906, to May 1, 1907, was $16,652.45, distributed as follows

Constructing mattresses	$3,605.71
Towing mattresses	190.00
Sinking mattresses	3,437.50
Grading	1,435.34
Paving	5,689.75
Unloading rock and spalls	686.59
Installation	877.00
Miscellaneous	10.00
Repairs to plant	20.84
Care of plant	411.21
Office and administration	288.71
Total	16,652.45

The repairs and maintenance of existing revetment cost $5,544.73 and the extension or new work $11,107.72. The present revetment now covers 3,440 linear feet of bank, measured parallel to the general shore line, and so far as is known is in good condition.

Map is herewith (Plate I) showing work done during the year. The field work was in charge of Assistant Engineer E. B. Geddes, assisted by Junior Engineer J. H. Alford, Inspector J. H. Lewis, and Overseer J. R. Allen.

The amount expended from June 30, 1906, to June 30, 1907, is $16,724.95, distributed as follows:

Office expenses (main office)		$305.31
Other administrative expenses		55.90
Construction (hired labor):		
Materials	$6,636.80	
Wages	7,116.84	
Subsistence	2,168.05	
		15,921.69
Repairs to plant		20.84
Care of plant		411.21
Miscellaneous		10.00
Total		16,724.95

In compliance with resolution of the Commission adopted April 9, 1906, there should be added to the above total cost for the year $1,147.73 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season and at the engineer depot was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $3,293.14.

ABSTRACT OF APPROPRIATIONS.

Bondurant Chute revetment.

By act of Congress of—	
March 3, 1899 (sundry civil act), allotted	$10,000
March 3, 1899 (sundry civil act), allotted	10,000
June 13, 1902 (river and harbor act), allotted	10,000
March 3, 1903 (sundry civil act), allotted	5,000
April 28, 1904 (sundry civil act), allotted	3,000
March 3, 1905 (sundry civil act), allotted	2,000
June 30, 1906 (sundry civil act), allotted	18,000
March 2, 1907 (river and harbor act), allotted	3,000
Total	61,000

2. Kempe Bend Revetment.

For history of this work, project, and details of its execution, see current summary and annual reports of the Chief of Engineers since 1900.

At the beginning of the year the subaqueous revetment was continuous for a length of 10,641 feet, measured parallel to the general shore line, but only a portion of the upper bank had been graded and paved.

On September 11 the bank in the large pocket at the extreme lower end of the revetment began caving and ultimately destroyed about 800 linear feet of protection work at this locality. The caving continued until in the bight of the pocket the bank line had receded over 200 feet. With this exception the work remained in good condition.

The work contemplated for the past season was to extend the revetment about 400 feet upstream to protect work in place; to repair a small cave at the lower end, and to pave the upper bank for a length of about 6,300 feet. Because of the continued high stage of the river and scarcity of labor this paving was impracticable. The remainder of the work planned has been completed.

Mattress construction for Kempe Bend was commenced October 11 at Big Black Island bar, about 40 miles above the work. A rise in the river occurred in the latter part of November and caused a suspension of operations from November 28 to December 17. Work was resumed, but another rise which overflowed the bar forced a suspension of mattress construction for the season on December 22. The sinking plant was moved from Bondurant Chute to Kempe Bend on October 27, and the first mattress was sunk on November 7. Operations continued until November 29, when the sinking plant was returned to Bondurant. On December 15 the plant again returned to Kempe Bend, and the sinking of mattresses was completed on January 7.

Grader *No. 5* was put in commission October 25 and worked on grading the upper bank in Kempe Bend until December 11, by which time the river had risen to so high a stage that it was not economical to continue grading. A small force was retained to unload rock from barges to the bank, but on February 9 all work was suspended for the season.

Constructing mattresses.—The mattress for this work, as well as others in the vicinity, were built at Big Black Island bar, and the cost and details of construction are given in the report on Giles Bend. For Kempe Bend there were constructed 450,000 square feet of mattress, valued at $13,521.42.

Towing mattresses.—The mattresses were towed a distance of about 40 miles downstream. The high stage of the river in November and December required the parking of the mattresses in Hardscrabble Bend for safety, and this extra handling increased the cost of towing, which was:

Tug *Marengo*, 9 days, at $24	$216
Tug *Morganza*, 10 days, at $25	250
Steamer *Tensas*, 21 days, at $23	483
Total	949
Total square feet of mattresses towed	450,000
Cost per square foot for towing	$0.00211

Sinking mattresses.—To repair the break at the lower end of the revetment required the placing of 230,400 square feet of mattress, covering 850 linear feet of bank. Between sections H and No. 20, 147,600 square feet of connecting mattresses were placed, covering 2,650 linear feet of bank and extending the revetment up to above the 10-foot contour. The revetment was extended upstream 230 linear feet by the placing of 72,000 square feet of mattress along the subaqueous bank. In all 450,000 square feet of mattress was placed, the detailed cost of sinking being:

Steamers and tugs	$2,084.00
Lumber, wire, wire nails, etc	234.82
3,166 tons of rock, at $2.36	7,471.76
Miscellaneous	59.42
Provisions	1,354.24
Pay rolls	3,872.50
Total	15,076.74
Total square feet of mattress sunk	450,000
Cost per square foot to sink	$0.0335

The rock used for ballasting the mattresses was loaded from the bank in the bend, and the cost of unloading last year and again loading on barges this season is included in the cost of sinking.

Cost of mattresses in place:	
Constructing mattresses	$0.03005
Towing mattresses	.00211
Sinking mattresses	.03350
Cost per square foot in place	.06556

Grading.—All of the upper bank grading was done by *Grader No. 5.* At the upper end of the revetment 319 linear feet were partially graded, and at the lower end 690 linear feet was completed, being a total of 1,009 linear feet. The details of cost are as follows:

Steamers and tugs	$148.00
Coal, oil, etc	185.00
Miscellaneous	15.00
Provisions	238.50
Pay rolls	899.95
Total	1,487.43
Linear feet of bank graded	1,009
Cost per linear foot	$1.474

Clearing and felling timber.—The trees and logs along the bank that was graded were removed, and 15 acres of timber along the banks, above and below the revetment, were felled, at a total cost of $485.38.

Towing rock.—A total of 3,350 tons of rock and 1,715 tons of spalls were towed from Vidalia, La., and Giles Bend, Mississippi, to Kempe Bend, at a cost of $555.

Unloading rock.—The cost of unloading 3,350 tons of rock and 1,715 tons of spalls from barges to the bank in Kempe Bend in detail was:

Pay rolls	$936.45
Provisions	318.00
Miscellaneous	27.00
Total	1,281.45

Installation.—The installation expenses of this work were relatively high, due to the frequent shiftings of the plant between Kempe and Bondurant, made necessary by the high and fluctuating stages of the river. This item also includes a proportion of the expense of returning the plant to the engineer depot at New Orleans, and amounted altogether to $1,209.29.

Surveys.—The regular annual hydrographic survey of the bend was made, and the field notes have been reduced and plotted. A comparison with the previous survey shows no changes of importance in the condition of the channel except in the pocket at the lower end of the revetment, where repairs were made this season. Cost, $693.09.

The total cost of the work in Kempe Bend from May 1, 1906, to May 1, 1907, was $40,322.66, distributed as follows:

Constructing mattresses	$13,521.42
Towing mattresses	949.00
Sinking mattresses	15,076.74
Grading upper bank	1,487.43
Clearing upper bank	485.38
Towing rock	555.00
Unloading rock	1,281.45
Installation	1,209.29
Surveys	693.09
Miscellaneous	105.94
Care of plant	1,051.12
Repairs to plant	248.90
New plant	890.53
Office and administration	2,767.37
Total	40,322.66

The value of rock and other materials on hand available for future construction is estimated at $29,716.85.

The repairs and maintenance of existing revetment cost $19,231.64 and the extension, or new work, $21,091.02. The present subaqueous revetment now covers 10,871 linear feet, measured parallel to the general shore line, having been extended during the past season 230 feet. So far as is known, all of the work is believed to be in good condition.

Map is herewith (Pl. II[a]) showing the work done during the year and the contours of the survey completed in November, 1906. The field work was in charge of Assistant Engineer E. B. Geddes, assisted by Junior Engineer J. H. Alford, Inspector J. H. Lewis, and Overseer J. R. Allen.

The amount expended from June 30, 1906, to June 30, 1907, is $36,167.14, distributed as follows:

Office expenses (main office)		$2,781.56
Other administrative expenses		387.94
Construction (hired labor):		
Materials	$6,167.79	
Wages	16,893.57	
Subsistence	6,801.76	
		29,863.12
Surveys		693.09
Repairs to plant		248.90
Care of plant		1,051.12
New plant		890.53
Miscellaneous		250.88
Total		36,167.14

In compliance with resolution of the Commission adopted April 9, 1906, there should be added to the above total cost for the year $3,840.74 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season, and at the engineer depot was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $7,293.31.

ABSTRACT OF APPROPRIATIONS.

Kempe Bend revetment.

By act of Congress of—	
March 3, 1899 (sundry civil act), allotted	$180,000
June 6, 1900 (sundry civil act), allotted	150,000
June 13, 1902 (river and harbor act), allotted	60,000
March 3, 1903 (sundry civil act), allotted	64,000
March 3, 1903 (sundry civil act), allotted by transfer	30,000
April 28, 1904 (sundry civil act), allotted	80,000
March 3, 1905 (river and harbor act), allotted	90,000
June 30, 1906 (sundry civil act), allotted	50,000
March 2, 1907 (river and harbor act), allotted	12,000
Total	716,000

3. Harbors of Natchez and Vidalia.

For history of this work, project, and details of its execution, see current summary and previous annual reports of the Chief of Engineers.

At the beginning of the year there were in place 18,108 linear feet of revetment of various kinds in two detached pieces—upper, 8,192 feet and lower, 9,916 feet. The unprotected interval between the upper and lower revetments was about 4,700 feet.

The high water of 1906 destroyed spurs Nos. 14 and 15, placed in 1897, but the condition of the balance of the revetment remained good. Caving along the unprotected bank in the interval between the two revetments still continues.

The work contemplated for the past season was to mattress about 1,050 linear feet of bank where spurs Nos. 14 and 15 had disappeared; to make repairs to

[a] Not printed.

spurs Nos. 3 and 9; to repair the concrete-in-situ pavement along the existing lower revetment, and to extend the subaqueous part of the lower revetment upstream about 1,100 feet.

All the plant required for the work was moored in the lower end of Giles Bend, where it had been laid up at the close of last season. On August 1 the quarter boat *Delta* was placed in commission. After a short stop in Kempe Bend to unload some spails and load two barges with rock, the tow proceeded to the willow bar at Big Black Island, where it had been decided to build the mattresses for all three works—Bondurant, Kempe, and Giles bends. The plant arrived at the willow bar about 25 miles below Vicksburg, Miss., on August 9. The cutting of willow brush, construction of roads, and building of ways was at once commenced, and the first mattress was launched August 17. Operations were delayed by the high and fluctuating stages of the river, which finally compelled an entire suspension of mattress construction on December 22. The amount of mattress required for the work in Giles Bend was 622,705 square feet, and this was completed on October 6. The quarter boat *Gamma* was placed in commission on August 15, and a small force was engaged in making repairs to upper bank pavement and loading rock from the supply stored on the bank until September 4, when the first mattress was sucessfully placed. Sinking continued without incident until October 12, when the last mattress was placed, and the plant transferred to Bondurant Chute.

Constructing mattresses.—The type of mattress used in Bondurant, Kempe, and Giles Bend revetments was the same, and the cost of building is consolidated, each work being charged with its pro rata of the total amount constructed. The repeated rise and fall of the river while this work was in progress interfered seriously with operations, and from November 28 to December 16 it became necessary to entirely suspend the work of mattress construction. On December 22 the river overflowed the bar, and work had to be suspended for the season after building a total of 1,192,705 square feet of mattress. The detailed cost of this was:

Steamers and tugs	$2,533.00
20,000 feet B. M. miscellaneous lumber	300.00
415,406 feet B. M. 2 by 4 inch lumber	6,046.39
181,470 feet B. M. 3 by 6 inch lumber	2,586.30
11,200 pounds 9-inch steel wire nails	229.95
34,300 pounds 6-inch steel wire nails	681.94
5,500 pounds 4-inch steel wire nails	95.00
5,191 pounds No. 10 galvanized wire	135.00
71,000 tree nails	168.00
221.51 acres of willows	221.51
Miscellaneous	118.67
Teams	4,386.40
Provisions	3,863.15
Pay rolls	14,471.50
Total	35,837.94
Total square feet of mattress built	1,192,705
Cost per square foot at ways	$0.03005

Of this total of 1,192,705 square feet, 622,705 were used in Giles Bend, the value being $18,710.81.

Towing mattresses.—The mattresses were towed downstream from the bar at Big Black Island to Giles Bend, a distance of about 60 miles, and the cost was:

Steamer *Tensas*, 19 days, at $23	$437
Tug *Morganze*, 21 days, at $25	525
Tug *Marengo*, 16 days, at $24	384
Total	1,346
Total square feet of mattress towed	622,705
Cost per square foot for towing	$0.00216

Sinking mattresses.—To extend the lower revetment upstream 1,100 feet with mattress 300 feet wide required the placing of 302,895 square feet. In making repairs at spurs Nos. 3, 9, 14, and 15, 319,810 square feet of mattress was used. In ballasting the mattresses 3,626 tons of rock was used, of which 2,008 tons was afloat on barges at the commencement of operations, and the remainder, 1,618 tons, had to be loaded from the supply stored on the bank in Kempe and

Giles bends. The cost of loading on barges and towing of same is included in the expense of sinking, which was:

Steamers and tugs	$1,762.00
Lumber, wire, wire nails, etc	210.36
3,264 tons of rock, at $2.05	6,681.20
362 tons of rock, at $2.30	832.60
Miscellaneous	56.36
Provisions	641.05
Pay rolls	4,868.80
Total	15,052.37
Total square feet of mattress sunk	622,705
Cost per square foot to sink	$0.02417
Cost of mattress in place:	
Constructing mattresses	$0.03005
Towing mattresses	.00216
Sinking mattresses	.02417
Total cost per square foot in place	.05638

Repairing pavement.—The filling up of holes, grading, and dressing was done by hand, and the cost can not be separated from the actual paving. In making the repairs the pavement used generally consisted of a foundation of spalls from 2 to 3 inches thick, on which was laid by hand a layer of rock from 7 to 8 inches thick. About 20,000 square feet of repair work remains unpaved, owing to a supply of rock not being available while the river was at a suitable stage. The area graded and paved was 39,368 square feet, and the detailed cost was:

Steamers and tugs	$250.00
244 tons spalls, at $2.05	500.20
214 tons rock, at $2.30	492.20
Miscellaneous	18.44
Provisions	188.70
Pay rolls	883.12
Total	2,332.66

Towing rock.—A total of 2,268 tons of rock was towed from Vidalia, La., to Giles Bend, at a cost of $259.89.

Unloading rock.—The unloading of the 2,268 tons of rock from barges to the bank in Giles Bend cost $502.41.

Installation.—A pro rata of the expense of towing the quarter boat to Big Black Island, the care of the plant while unloading rock in Giles Bend, and of returning the plant to the engineer depot at New Orleans amounts to $457.34

Surveys.—The annual hydrographic survey of the bend was made. As compared with the previous survey, no changes of importance are noted, except in the vicinity of spurs Nos. 13 and 14. The cost of the survey work was $1,235.29.

Cowpen Point levee.—The care and maintenance of this levee, built to prevent the flow of water across Cowpen Neck during high stages of the river, cost $118.46.

The total cost of the work in Giles Bend from May 1, 1906, to May 1, 1907, was $43,414.72, distributed as follows:

Construction of mattresses	$18,710.81
Towing of mattresses	1,346.00
Sinking of mattresses	15,052.00
Repairing pavement	2,332.66
Towing rock	259.89
Unloading rock	502.41
Installation	457.34
Surveys	1,235.29
Maintenance of Cowpen Point levee	118.46
Miscellaneous	430.58
Repairs to plant	238.22
Care of plant	471.31
New plant	726.33
Office and administration	1,533.05
Total	43,414.72

At the commencement of the season there was material on hand valued at $742.10 to the credit of Giles Bend. At the close of the season all material had been used.

The repairs and maintenance of existing revetment cost $22,301, and the extension or new work $21,113.72. The subaqueous revetment was extended 1,100 feet and now covers 19,208 linear feet of bank in two detached pieces, respectively, 8,192 feet at the upper end of the bend and 11,016 feet at the lower. There remains a gap of about 3,700 feet of unprotected bank between the upper and lower revetments. All of the repair work around the spurs and to the upper bank pavement could not be completed on account of the high stage of the river during the working season. With this exception it is believed that all of the work in place is in good condition, but a long stretch of upper bank has yet to be graded and paved.

Map is herewith (P. III), showing the work of this and previous years and the soundings of the survey completed in October, 1906. The field work was in charge of Assistant Engineer E. B. Geddes, assisted by Junior Engineer J. H. Alford, Inspector J. H. Lewis, and Overseer J. R. Allen.

The amount expended from June 30, 1906, to June 30, 1907, is $43,157.25, distributed as follows:

Office expenses (main office)		$1,679.89
Other administrative expenses		212.79
Construction (hired labor):		
Materials	$16,666.10	
Wages	17,035.83	
Subsistence	4,460.91	
		38,162.84
Surveys		1,235.29
Repairs to plant		238.22
Care of plant		471.31
New plant		726.33
Miscellaneous		430.58
Total		43,157.25

In compliance with resolution of the Commission adopted April 9, 1906, there should be added to the above total cost for the year $3,228.52 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season, and at the engineer depot, was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $8,276.49.

ABSTRACT OF APPROPRIATIONS.

Harbors of Natchez and Vidalia.

By act of Congress of—	
June 16, 1880 (sundry civil act)	$40,000.00
March 3, 1881 (river and harbor act)	50,000.00
July 13, 1892 (river and harbor act)	80,000.00
August 18, 1894 (sundry civil act)	80,000.00
June 3, 1896 (river and harbor act), allotted	64,000.00
March 3, 1899 (sundry civil act), allotted	50,000.00
June 13, 1902 (river and harbor act), allotted	60,000.00
March 3, 1903 (sundry civil act), allotted	12,000.00
March 3, 1905 (sundry civil act), allotted	40,000.00
June 30, 1906 (sundry civil act), allotted	50,000.00
Received from sales, blueprints	2.10
Total	526,002.10

Prevention of cut-off at Giles Bend, Louisiana.

By act of Congress of—	
June 4, 1897 (sundry civil act), allotted	$110,000.00
June 6, 1900 (sundry civil act), allotted	150,000.00
Total	260,000.00

Emergencies in river and harbor works—Allotment for "Mississippi River at Giles Bend."

By act of Congress of—

April 28, 1904 (sundry civil act), allotted	$40,000.00
Grand total	826,002.10

4. Improving Atchafalaya and Red Rivers, Louisiana.

For history of this work, project, and details of execution, see current summary and previous reports of the Chief of Engineers.

The work contemplated for the past season was to repair and maintain the dredge *The Ram*, to repair Sill Dam No. 3, in the Atchafalaya River, and to do such dredging as might be necessary to maintain low-water navigation between the Mississippi, Red, and Atchafalaya rivers through lower Old River.

During the past year no work has been required to maintain low-water navigation, a sufficient depth of water being found in lower Old River at all times. As extreme low water is required to make the repairs to the east shore end of Sill Dam No. 3 in a proper and economical manner, it has been impracticable to do this work up to the present time. As a result operations have been limited to inspections of the channel, the maintenance of the plant, and the annual surveys.

It has been noted in previous reports that a constant direction of current through Old River is a prime factor in producing conditions favorable for the maintenance of low-water navigation. During the period covered by this report the current has been toward the Mississippi for only thirty-two days, and for the remainder of the time, three hundred and thirty-three days, toward the Atchafalaya, being constant in this direction since June 15, 1906. This, together with the absence of extreme low water, would serve to explain the favorable conditions of the past year, but other causes must also be considered in connection with the uniformly successful results of operations for the past fourteen years, during three of which no dredging was required. The table following gives the lowest water of the years mentioned on the Red River Landing and Barbres gauges, and the results of endeavors to maintain low-water navigation since the United States assumed charge of this work. The years refer to the low-water season and not to the date of the annual reports.

Year.	Red River Landing gauge.	Barbres Landing gauge.	Results of operations to maintain low-water navigation.
1879	0.5	(a)	Unsuccessful. Navigation suspended.
1880	6.1	5.0	Successful. Navigation open.
1881	3.4	−1.2	Unsuccessful. Navigation suspended.
1882	9.1	8.6	Do.
1883	3.9	− .4	Do.
1884	6.3	1.7	Successful. Navigation open.
1885	6.7	1.5	Do.
1886	2.7	2.2	Unsuccessful. Navigation suspended.
1887	.5	.0	Do.
1888	3.9	.9	Successful. Navigation open.
1889	2.4	2.4	Partially successful.
1890	8.8	5.3	Successful. Navigation open.
1891	1.4	−1.0	Unsuccessful. Navigation suspended.
1892	2.2	− .2	Do.
1893	4.1	1.0	Successful. Navigation open.
1894	− .2	−1.7	Do.
1895	− .6	−1.2	Do.
1896	3.8	.5	Do.
1897	.4	−1.8	Do.
1898	9.5	7.1	Do.
1899	1.0	−1.3	Do.
1900	5.3	3.0	Do.
1901	2.0	.2	Do.
1902	7.8	7.1	No dredging required.
1903	2.8	1.3	Do.
1904	3.0	.3	Successful. Navigation open.
1905	11.0	9.0	Do.
1906	11.8	8.8	No dredging required.

[a] No record.

The table shows that in the fourteen years preceding 1893 the attempt to maintain low-water navigation through Old River failed eight times, and that during the fourteen years since and including 1893 low-water navigation has been maintained without interruption. During three of the latter years, 1902, 1903, and 1906, no work was required to attain the desired condition. The advent of the hydraulic dredge *The Ram* in 1893 partially explains the conditions developed in the table, but this alone is not sufficient. Changes in the physical characteristics of Old River must also be taken into consideration, the most marked of these changes being the comparative absence of subsiding banks and the building up of the same by annual accretions to form a channel of approximately uniform cross section, to which the water is confined below a 30-foot stage. In the early years the principal trouble from shoal water was to be found in the vicinity of "Dead Tree," "Ash Cabin," "The Crossing," and other places the names of which are now almost forgotten. Since 1900 all operations necessary for the maintenance of low-water navigation have been confined to the bar at the Mississippi entrance, and a recurrence of the conditions prevailing prior to that date seems scarcely probable.

The annual hydrographic survey over the sill dams in the Atchafalaya and of lower Old River has been made. The survey was commenced on August 29 and completed September 28. Reduction of field notes and platting of same has been finished, with results as follows: In the vicinity of the sill dams no changes of consequence are developed. Compared with the previous survey, a slight fill is indicated in some places and in others a slight scour. Below Sill Dam No. 3 the east bank is filling and the west bank scouring.

Through lower Old River the survey develops a continuous low-water channel 5 feet or more below the zero of the Barbres gauge, except over the bar at the Mississippi entrance. The usual table of average areas, widths, maximum and mean depths, referred to a plane 35 feet above the zero of the Barbres gauge, has been compiled, and is compared and summarized as follows:

Comparisons, 1894 and 1906.

Year.	Average area.	Average width.	Average maximum depth.	Average mean depth.
	Sq. feet.	*Feet.*	*Feet.*	*Feet.*
1894	20,901	79.3	46.8	26.6
1906	20,643	67.4	47.9	30.8
Decrease	258	11.9	.....	.....
Increase	.....	.....	1.1	4.2

Comparisons, 1905 and 1906.

Year.	Average area.	Average width.	Average maximum depth.	Average mean depth.
	Sq. feet.	*Feet.*	*Feet.*	*Feet.*
1905	20,536	69.8	47.4	29.6
1906	20,643	67.4	47.9	30.8
Decrease	.....	2.4	.....	.....
Increase	107	.....	.5	1.2

These tables develop the fact that during the past twelve years lower Old River has decreased in average cross-sectional area and in average width, and has increased slightly in average maximum depth and nearly 16 per cent in average mean depth. The increases shown in the comparative table of 1905 and 1906 are due to scour occasioned by the continued current from the Mississippi toward the Atchafalaya, and for this reason may be only temporary.

Under authority of the Secretary of War the dredge *The Ram* was engaged until July 2, 1906, in dredging material for filling and grading at the New Orleans naval station. The conditions under which the dredge was loaned are given in last annual report. On return of *The Ram* to the engineer depot repairs to dredge, pontons, and lighter necessary to make good wear and tear were at once undertaken, and the plant placed in condition for future opera-

tions in Old River. In April, 1907, the dredge was docked, the steel hull scraped, and a coat of coal tar burned on to light water line.

So far as is known at the close of this report, no change has occurred in the condition of the sill dams in the Atchafalaya. The conditions in Old River have been fully described.

The amount expended from June 30, 1906, to June 30, 1907, is $6,563.15, distributed as follows:

Office expenses (main office)		$123.45
Dredging in Old River:		
Materials	$1,996.19	
Wages	45.75	
		2,041.94
Surveys		820.35
Repairs to plant		2,710.04
New plant		692.92
Expended under Navy Department:		
Pay rolls (services)	$46.32	
Fuel, deck, and engine-room supplies	128.13	
		174.45
Total		6,563.15

In compliance with resolution of the Commission adopted April 9, 1906, there should be added to the above total cost for the year $1,947.28 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration.

ABSTRACT OF APPROPRIATIONS.

Mouth of Red River, Louisiana.

By act of Congress of—	
June 18, 1878 (river and harbor act), allotted	$150,000.00
March 3, 1879 (sundry civil act), allotted	40,000.00
July 5, 1884 (river and harbor act), allotted	[a] 11,390.00
July 5, 1884 (river and harbor act), allotted by transfer	10,500.00
July 5, 1884 (river and harbor act), allotted by transfer	1,400.00
July 5, 1884 (river and harbor act), allotted	15,000.00
	228,290.00

Rectification of Red and Atchafalaya rivers.

By act of Congress of—	
August 5, 1886 (river and harbor act), allotted	$187,500.00
August 11, 1888 (river and harbor act), allotted	250,000.00
September 19, 1890 (river and harbor act), allotted	[b] 217,000.00
September 19, 1890 (river and harbor act), allotted by transfer	3,000.00
July 13, 1892 (river and harbor act), allotted	80,000.00
August 18, 1894 (sundry civil act), allotted	[c] 70,000.00
June 3, 1896 (river and harbor act), allotted	40,000.00
March 3, 1899 (sundry civil act), allotted	25,000.00
June 13, 1902 (river and harbor act), allotted	15,000.00
June 13, 1902 (river and harbor act), allotted	1,000.00
March 3, 1905 (sundry civil act), allotted	24,000.00
Settlement by Navy Department, February 6, 1907	8,666.42
	921,166.42
Grand total	1,149,456.42

[a] Original allotment, $12,290; $900 transferred to harbor at New Orleans.
[b] Original allotment, $225,000; $8,000 transferred to harbor at New Orleans.
[c] $2,500 expended improving Bayou des Glaises.

5. New Orleans Harbor.

For history of this work, project, and details of its execution, see current summary and previous annual reports of the Chief of Engineers.

For general map showing location of works of improvement in New Orleans Harbor, see Plate V, Annual Report for 1905, opposite page 280, Supplement.

On August 1 the quarter boat *New Orleans* and other plant was towed to Palmetto bar, about 27 miles below Natchez, and the cutting of willow brush commenced. Ways were built and construction of mattresses and cribs begun on August 16. On September 20 all of the willow brush on Palmetto bar had been used, and the plant was moved to Langside, Miss., a few miles below Fort Adams, where the cutting of willow brush and construction of another set of ways was commenced September 22. Crib and mattress construction was resumed on October 3 and continued until December 11, when operations were closed for the season for reasons stated later on in this report. The first tow of mattresses left Palmetto bar on August 22 and arrived in New Orleans August 24. The last tow arrived in New Orleans on December 22. All long-distance towing was done by the tug *Tunica*. On October 1 a force was organized in New Orleans, and on the next day the sinking plant was moved to the Gouldsboro Bend. In the absence of a regular quarter boat the dredge *The Ram* was utilized as an office and quarters for the principal employees. Plant was placed in position and the first mattress sunk October 11. Operations continued until November 30, when all the work projected in the Gouldsboro Bend was completed. On account of lack of rock it became necessary to suspend work until a supply of this necessary material could be secured. The sinking force was reorganized December 17 and the plant placed in position in the lower end of the Carrollton Bend to sink mattresses along the 60-foot contour. The river was at a high stage, and after several accidents to mattresses and plant work at this locality was completed January 11 and all plant returned to the engineer depot and put out of commission.

Mattress and crib construction.—Localities where willow brush can be obtained in large quantities are now scarce in this district, owing to the large amount cut and taken away for the jetties at the Southwest Pass. As a consequence, the mattress-constructing plant had to be moved from Palmetto bar, where the first installation was made, to Langside, Miss. The latter locality was not a favorable site for ways, being on a caving bank, but on account of the scarcity of willow brush had to be selected. The willow brush at Langside was exhausted on December 11 before all of the mattress work had been completed. The quantity yet remaining to build was too small to justify the expense of moving the plant to another willow bar and constructing another set of ways. Labor had become scarce and the holiday season was approaching, during which time it is practically impossible to secure colored labor. The rise in the river, which culminated in the unusual high water of 1907, was in sight, and the outlook for obtaining rock for ballasting the mattresses was uncertain. It was therefore decided to suspend construction, and the force was accordingly disbanded, after constructing 402,100 square feet of mattress and 693,456 cubic feet of crib. The detailed field cost of this portion of the work was as follows:

Mattress:	
60,000 feet B. M., 3 by 6 inch lumber	$980.00
163,400 feet B. M., 2 by 4 inch lumber	2,598.18
4,400 pounds 9-inch steel wire nails	96.80
11,100 pounds 6-inch steel wire nails	233.10
3,600 pounds 4-inch steel wire nails	75.60
2,650 pounds No. 10 galvanized wire	72.88
4,142 cords willow brush	4,517.78
24,700 treenails	78.08
Service of tugs	1,357.74
Miscellaneous	149.91
Provisions, including ice	1,831.66
Pay rolls, services	5,150.10
Total	17,141.83
Square feet of mattress built	402,100
Cost per square foot for construction	$0.0426

Cribs:	
129,995 feet B. M. 3 by 6 inch lumber	$2,674.38
8,800 pounds 9-inch steel wire nails	198.00
2,300 pounds 6-inch steel wire nails	48.30
300 pounds 4-inch steel wire nails	6.30
6,020 pounds No. 10 galvanized wire	165.55
2,982 cords willow brush	8,252.33
11,400 tree nails	25.65
Services of tugs	782.16
Miscellaneous	149.92
Provisions, including ice	1,572.20
Pay rolls, services	4,282.25
Total	12,502.00
Cubic feet of cribs built	693,456
Cost per cubic foot for construction	$0.018

Willow brush.—At no one locality can a sufficient quantity of brush be found for a full season's work. In order to obtain brush at all long hauls are necessary, and unfavorable locations for mattress ways must be occupied. All of this tends to increase the cost, which during the past season was—

Cutting, piling, and loading	$4,326.60
Teams hauling	3,271.55
Privilege of land	171.84
Total	7,770.01
Cords of willow brush used	7,124
Cost per cord delivered at ways	$1.09

Ways.—During the past season it was necessary to build three sets of ways for mattress and crib construction. The first set of ways built at Palmetto bar became useless when the willow brush at that place was exhausted. On moving to Langside a new set of ways was built, the expense for grading the bank being unusual. Owing to the gradual subsiding of the bank on which they were built, these ways were twisted out of shape and a third set had to be constructed. An innovation this year was the use of machine bolts for fastenings, instead of wire nails. A much better job resulted; and, as many of the timbers can now be used over and over again, a considerable economy in the construction of ways will be obtained in the course of time. An accurate record was kept of the cost of the three sets of ways, with the following result:

Total cost three sets of ways	$1,121.22
Average cost one set of ways	373.74

Towing.—All mattresses and cribs were built at Palmetto bar and Langside, respectively 237 and 207 miles distant from New Orleans. Practically all of the long-distance towing was done by the tug *Tunica*, manned most of the time by a double crew. The cost of towing lumber and other materials from New Orleans to the mattress constructing plant is included in the value of such materials delivered at destination. The cost of towing 402,100 square feet of mattress and 693,456 cubic feet of cribs from the place of construction to New Orleans was as follows:

Tug *Manchac*, 3 days, at $19.90	$59.70
Tug *Tunica*, 94 days, at $27.64	2,608.16
Total	2,667.86
Cost per square foot for towing mattress	$0.00389
Cost per cubic foot for towing cribs	.00167

Sinking.—On October 2 the sinking plant was moved to Gouldsboro Bend. Unexpected difficulty was experienced in accumulating a sufficient force of laborers, and it was not until October 11 that the first mattress was sunk. Operations were continued without incident worthy of note until November 30, by which time new spurs Nos. 2½, 3½, 4½, and 5½, containing 208,500 square feet of mattress and 590,592 cubic feet of cribs, had been successfully placed. Three buttress spurs immediately below spurs Nos. 2, 4, and 6, containing 66,384 cubic

feet of cribs, were completed. Repairs to the shore ends of old spurs Nos. 1, 2, 3, 4, 5, and 6 were made, 43,600 square feet of mattress and 36,480 cubic feet of cribs being placed for this purpose. This completed all work under the current project in the Gouldsboro Bend.

Detailed field cost was as follows:

New spurs Nos. 2½, 3½, 4½, and 5½:	
3,063.7 tons of rock, at $1.86⅔	$5,718.90
Lumber, wire, wire nails, etc	243.75
Tugs	780.44
Miscellaneous	78.00
Provisions, including ice	466.43
Pay rolls, services	4,723.06
Total	12,010.58
Average cost of sinking each spur	3,002.64
Three buttresses below spurs Nos. 2, 4, and 6:	
333.1 tons of rock, at $1.86⅔	621.80
Lumber, wire, wire nails, etc	12.45
Tugs	139.30
Miscellaneous	73.00
Provisions, including ice	73.21
Pay rolls, services	601.65
Total	1,521.41
Average cost of sinking each buttress	507.14
Repairs to shore ends, spurs 1, 2, 3, 4, 5, and 6:	
609.8 tons of rock, at $1.86⅔	1,138.27
Lumber, wire, wire nails, etc	45.55
Tugs	407.76
Miscellaneous	39.00
Provisions, including ice	160.00
Pay rolls, services	858.00
Total	2,648.58
Average cost of sinking repair work, each spur	441.43

Upon completion of the sinking in the Gouldsboro Bend it became necessary to suspend operations, owing to the lack of ballast. The contractors who were furnishing rock stated that on account of the failure of the railroad to supply cars they were unable to meet the demands of the work for rock. The laborers were paid off, and the principal employees and tug's crew retained to care for mattresses afloat, make surveys, and permanently mark the location of the spurs in the bend. Additional ballast was finally obtained from the supply intended for works above Natchez, and on December 17 the sinking force was reorganized and quartered on the *New Orleans*, which had been returned to the engineer depot after mattress construction was suspended. The plant was moved to the lower end of the Carrollton Bend and the work of placing mattresses on the subaqueous bank along the 60-foot contour commenced. Owing to abnormal conditions great difficulties were encountered and numerous accidents occurred. The river had risen to a high stage and was full of heavy drift. On one occasion all of the mooring cables parted and the entire plant went adrift. On the night of January 3, while the plant and a partially ballasted mattress were in position, a piece of heavy drift or wreckage struck the outer barge and tore off one of the bottom planks. The barge sank and dumped its load of rock, partially wrecked the mattress, and injured an adjoining barge. The sunken barge was recovered in a badly damaged condition, but a portion of the mattress was lost. On another occasion, on account of the accumulation of heavy drift under a mattress, some of the wire cables broke while it was being sunk, and a strip on the outer edge dumped its ballast, coming to the surface bottom side up. This strip was afterwards sunk on the inshore edge instead of the outer one, where it belonged. Owing to the accidents described, as well as numerous minor ones, the cost of this portion of the season's work was excessive. The last mattress was finally sunk on January 11 and the work of the season closed, the river at this date reading 13.5 and rising on

[illegible] ton Bend was [illegible], was—

[illegible]	$2,441.80
[illegible]	261.95
[illegible]	896.90
[illegible]	65.00
[illegible] ice	855.10
[illegible]	2,420.09
Total	6,940.84
Cost per square foot to sink	0.04627

Rock.—The necessary rock for ballasting the mattresses and cribs was obtained from various sources and at varying prices per ton. Some was obtained under contract delivered on Government barges, some from vessels arriving in the harbor with stone ballast, and some from a small supply on the bank, being the remainder of purchases made in previous years. A lot of about 1,000 tons was obtained at Vidalia, La., being a part of the supply intended for work in Giles and Kempe bends. To avoid a variety of prices, an average cost per ton delivered on the works has been computed and found to be $1.86¾.

Installation.—The expense of towing the quarterboat and other plant to Palmetto bar, preliminary organization of force, transferring the force and plant to Langside, and other preparatory and incidental expenses amounted to $110.56.

Surveys.—All of the mattresses and cribs were located instrumentally and permanent marks, from which to locate the work of this and former years in the Gouldsboro Bend, were established. The cost of this was $264.01. The annual hydrographic survey of the Carrollton Bend, a portion of the Gretna Bend, and of the Third District reach, has been made and platted. The results of these surveys indicate no marked changes from the conditions prevailing last year. In compliance with a resolution of the Commission a careful survey of a portion of the Greenville Bend in the vicinity of Amesville was made, and report, estimate, and map compiled and forwarded.

The total cost of the work in New Orleans Harbor from May 1, 1906, to May 1, 1907, was $61,932.52, distributed as follows:

Construction of mattresses and cribs, including ways	$30,765.65
Towing mattresses and cribs	2,667.86
Sinking mattresses and cribs	23,121.41
Installation	110.56
Surveys	264.01
Miscellaneous	1,375.70
Repairs to plant	254.49
Care of plant	678.90
New plant	1,743.66
Office expenses and administration	950.28
Total	61,932.52

The value of lumber, rock, and other material on hand available for future construction is estimated at $6,443.63.

The total field cost of the repairs to old spurs in the Gouldsboro Bend was $5,393.10, to which should be added a pro rata of office and other incidental expenses, making a total of $5,709. This is believed to be the first charge for maintenance or repair of work in place since the present general project was adopted in 1884.

Maps [a] are herewith (Plates IV and V), showing the work of this and previous years. The field work for New Orleans Harbor was in charge of Asst. Engineer H. S. Douglas, assisted by Junior Engineers G. D. Waddill and C. T. Rayner, jr.

[a] Not printed.

The amount expended from June 30, 1906, to June 30, 1907, is $62,508.84, distributed as follows:

Office expenses (main office)		$852.98
Other administrative expenses		297.27
Construction (hired labor):		
Materials	$19,312.70	
Wages	30,215.47	
Subsistence	7,373.66	
		56,901.83
Surveys		264.01
Repairs to plant		254.49
Care of plant		678.90
New plant		1,743.66
Miscellaneous		1,515.70
Total		62,508.84

In compliance with resolution of the Commission adopted April 9, 1906, there should be added to the above total cost for the year $4,320.90 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant for care and repair of plant during the lay-off season and at the engineer depot was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $11,774.33.

ABSTRACT OF APPROPRIATIONS.

New Orleans Harbor.

"Improving harbor at New Orleans, La.:"

By act of Congress of—	
June 18, 1878 (river and harbor act)	$50,000.00
March 3, 1879 (sundry civil act)	60,000.00
June 16, 1880 (sundry civil act)	75,000.00
March 3, 1881 (river and harbor act)	75,000.00
August 2, 1882 (river and harbor act), allotted by transfer	162.86
January 19, 1884 (river and harbor act), allotted by transfer	1,400.00
July 5, 1884 (river and harbor act), allotted by transfer	4,900.00
July 13, 1892 (river and harbor act)	80,000.00
August 18, 1894 (sundry civil act)	110,000.00
June 3, 1896 (river and harbor act)	110,000.00
March 3, 1899 (sundry civil act)	110,000.00
Received from sale of property	38.63
Total	676,501.49

"Improving Mississippi River, New Orleans Harbor:"

By act of Congress of—	
August 5, 1886 (river and harbor act)	$75,000.00
August 11, 1888 (river and harbor act)	[a] 199,888.00
September 19, 1890 (river and harbor act)	100,000.00
September 19, 1890 (river and harbor act), allotted by transfer	8,000.00
June 4, 1897 (river and harbor act), allotted by transfer	10,000.00
June 4, 1897 (river and harbor act), allotted by transfer	40,000.00
June 13, 1902 (river and harbor act)	95,000.00
March 3, 1905 (sundry civil act)	85,000.00
June 30, 1906 (sundry civil act)	10,000.00
Received from sales, blueprints	.50
Total	622,888.50
Grand total	1,299,389.99

[a] Original allotment, $200,000; $112 reserved by Chief of Engineers for office expenses.

6. PLANT.

At date of last annual report the working plant of the district consisted of 55 large pieces. During the year one standard barge of creosoted timber, *No. 43*, has been built and delivered under contract. Barges *Nos. 22, 24*, and *27* have been condemned and sold, and barge *No. 23* was wrecked and lost in the tropical storm of September, 1906. The old hull of the quarter boat *New Orleans* has been beached and used as the foundation for a large warehouse for the storing of tools, manila lines, and other materials. The old floating warehouse was also beached and is now used as a combined carpenter, blacksmith, and machine shop, and in it has been installed boiler and engine, together with ripsaw, band saw, bolt and pipe machines, for use in repair work to boats and barges. Sundry minor improvements have been made to buildings and grounds at the engineer depot, head of Millaudon street, where the plant of the district has been repaired, maintained, and cared for. Repairs were made as follows:

Designation.	Cost.	Work done.
Steamer Gen. John Newton	$438.55	6 wire screens were fitted in forward windows of cabin; 60 feet of new deck plank was put in; new foundation put under air pump; 51 braces and 17 bucket planks were put in wheel; 2 rudder stops of heavy angle iron were made and bolted in place.
Steamer Tensas	51.25	New wheel flange; 48 wheel stirrups, and new cushion.
Dredge The Ram	2,509.11	Docked in public dock; hull scraped and coat of coal tar to light water line burned on; new rubberoid roof on cabin; pilot house sheathed on sides; new lignumvitæ for cutter shaft; fair heads on cutter frame repaired and fitted with new steel pins; 30 side links and 50 new pins made for sprocket chain; 3 brass thumb rings, 1 brass thumb collar and lock nut, and 2 brass bushings were made; main stop valves repaired and joints in steam pipe renewed.
Tug Morganza	153.79	Exterior scrubbed and painted from water line up.
Tug Tunica	409.82	365 feet deck plank put in at stern; deck calked; hull above water line painted; cabin scrubbed and varnished; frames and plates in stern compartment of hull scraped and painted; kitchen, dining room and crew's quarters cleaned.
Tug Marengo	787.03	Docked; rudder and propeller unshipped; new cast-iron stern bushing made and fitted in place; outside of hull scraped and painted above water line; engine compartment of hull cleaned; new interior and exterior smokestack made and placed.
Tug Manchac	1,245.61	Docked; 896 feet new planking put in hull at water line; hull and deck calked; seams puttied; machinery repaired; boat painted.
Launch Beatrice	69.15	Docked; brass tail shaft taken off and new one of steel put in; tie rods put in to prevent vibration of engine.
Grader No 5	1,604.92	Docked in public dock; about 3,000 feet bottom plank put in; bottom, rakes and sides to water line calked; new sill under one side of house; 10 bunks and new stairway built; rooms painted; boiler cleaned; decks patched; roof painted; hold cleaned.
Quarter boat New Orleans	596.18	11 door frames repaired; 901 transom sash fitted with weather strips; windows overhauled and lights puttied; roof at one end of skylight repaired; deck pump repaired; main deck on each end of boat calked; rooms and outside of cabin cleaned; hold cleaned.
Quarter boat Alpha	275.57	Camel dock under each end; 3 new rake plank; rakes and sides calked; screen doors fitted with new wire cloth; stovepipe repaired.
Quarter boat Beta	249.92	Camel dock under each end; 6 large graving pieces in sides; rakes and sides calked; coat of roofing pitch and sand put on roof; screen doors and windows fitted with new wire cloth; stovepipe repaired; canvas lining in cabin removed and cabin painted.
Quarter boat Gamma	294.00	Two iron bitts placed on front deck; screen doors and windows repaired; roof painted; hold cleaned; minor repairs; blankets and ticks washed and ticks refilled with excelsior.
Quarter boat Delta	328.82	Guards and cavils repaired; deck on each end calked; roof painted; hold cleaned; minor repairs; blankets and ticks washed and ticks refilled with excelsior.
Barge No. 4	729.88	Docked; 14 graving pieces put in sides; 3 rake plank and 10 short pieces put in rakes; bottom, rakes, and sides calked; iron bits and old sheathing removed from deck; 1,000 feet new decking put down; deck calked and seams paid off with soft pitch, then covered with roofing paper and sheathed; iron bitts replaced; barge painted.

Designation.	Cost.	Work done.
Barge No. 5	$30.50	Sides and rakes calked; hold cleaned; capstan and iron bitts overhauled.
Barge No. 6	23.92	1 seam above water line calked; holds cleaned; capstans and bitts overhauled.
Barge No. 7	27.12	
Barge No. 8	26.06	
Barge No. 9	23.13	
Barge No. 10	38.85	Camel dock under one end; rake calked; 248 feet oak chafing streak spiked to edge of deck.
Barge No. 12	400.87	Camel dock under each end; rakes and sides calked; iron bitts and old sheathing on deck removed; deck covered with roofing paper and resheathed; iron bitts put back in place.
Barge No. 13	39.55	Camel dock under each end; rakes calked.
Barge No. 14	544.92	Docked; 1 piece bottom plank put in; corner irons put on rakes; bottom, sides, and rakes calked; sheathing on deck repaired.
Barge No. 15	177.80	Docked; 6 new bottom plank put in; 2 additional tie-rods put in between bottom gunwales; raked and sides calked.
Barge No. 16	7.98	Corner irons and head blocks repaired.
Barge No. 17	428.51	Camel dock under each end; 3 short pieces rake plank put in; 1,664 feet new decking put in; 3,000 feet deck sheathing renewed; capstan overhauled; hold cleaned; rakes, sides, and new decking calked.
Barge No. 18	118.81	Camel dock under each end; corner irons removed; rakes and head blocks calked; corner irons replaced.
Barge No. 19	119.47	Camel dock under each end; rakes and sides calked; corner irons put on rakes.
Barge No. 20	39.03	Sides and rakes calked; hold cleaned; capstan and iron bitts overhauled.
Barge No. 22	44.50	Capstan and iron bitts removed.
Barge No. 26	154.53	Camel dock under each end; rakes and sides calked.
Barge No. 28	96.10	Rakes and sides calked and painted; 850 feet sheathing on deck renewed; corner irons and bitts overhauled.
Barge No. 29	31.73	1 seam above water line calked; holds cleaned; capstans and iron bitts overhauled.
Barge No. 30	21.00	
Barge No. 31	50.00	Sides and rakes calked; hold cleaned; capstan and iron bitts overhauled.
Barge No. 32	252.00	1 seam above water line calked; holds cleaned; capstans and iron bitts overhauled.
Barge No. 33		
Barge No. 34		
Barge No. 35		
Barge No. 36		
Barge No. 37		
Barge No. 38		
Barge No. 39		
Barge No. 40		
Barge No. 41		
Barge No. 42		
Sectional dock	329.01	The mud and water in the holds of the three sections was cleaned out, and 1,600 feet of new planking was put in sections and calked.
Dry dock	409.84	New end gate built and put in place; interior of dock cleaned of mud and débris.
Camel dock	334.29	Docked; 6 new deck beams, 12 new stanchions, and 212 feet of planking were put in; trunks and deck caulked.
Pump boat	25.99	The worn-out steam cylinder of main pump was removed and a new one installed.
Skiffs	156.37	8 new skiffs were built and 3 old ones repaired.
Wire cable reel stands	170.70	29 new stands on which to mount reels of wire mooring cables were made
Wheelbarrows	41.71	221 wheelbarrows were repaired.
Miscellaneous repairs	1,276.50	Installing boiler, engine, and feed pump, together with shafting, band saw, etc., in machine shop; building warehouse on old hull of quarter boat New Orleans; new stages for wheeling rock on and off barges; new timber truck; repairing box pumps; new hatch covers; overhauling irons from condemned barges; repairing calking flats and other minor items.
Wire cables	175.20	39 reels of wire mooring cables were cleaned and painted.
Total	15,359.49	

Care of plant.—In addition to the foregoing, the cost of caring for the plant while not in use, including such items as watching at night, setting spars, putting out and taking in mooring lines, operating pump boat, salaries of one boat's crew, general supervision, etc., amounted to $8,368.80.

Condition of plant.—With the exception of wear and tear incident to the work of the past season, the general condition of the plant is good. The hulls of some of the quarter boats and barges, built of untreated timber, are in bad condition. The quarter boats *Beta* and *Delta* require extensive repairs, and barges *Nos. 1, 2, 3, 20, 21,* and *25* are now beyond economical repair.

Proposals for the five new barges authorized last year were advertised twice, but the prices asked were considered excessive and all bids were rejected. Authority was obtained to build the barges by hired labor, and the necessary lumber and other material has been purchased. The timber for three of these barges has been framed, and material for two of them creosoted. On account of the high stage of the river covering the land outside the levee it has not yet been practicable to set blocking and commence the erection of any of the barges.

Plans for a derrick barge have been made, and material purchased, together with hoisting engine and derrick irons. The delivery of the lumber has commenced.

The amount expended from June 30, 1906, to June 30, 1907, is $43,796.69, distributed as follows:

Office expenses (main office)		$1,973.84
Other administrative expenses		101.10
Repairs (hired labor):		
Materials	$5,255.09	
Wages	13,785.48	
Subsistence	1,000.41	
		20,040.98
Care of plant		8,798.09
New plant		1,320.00
Miscellaneous		15.75
		32,249.76
New plant:		
Construction of barges, etc		11,546.93
Total		43,796.69

ABSTRACT OF APPROPRIATIONS.

Plant.

By act of Congress of—	
August 18, 1894 (sundry civil act), allotted	$10,000.00
June 4, 1897 (sundry civil act), allotted	20,000.00
Transferred from Quartermaster's Department, authority Secretary of War, September 21, 1898	8,000.00
By act of Congress of—	
July 1, 1898, (sundry civil act), allotted	5,556.00
March 3, 1899 (sundry civil act), allotted	64,444.00
June 6, 1900 (sundry civil act), allotted	25,000.00
June 13, 1902 (river and harbor act), allotted	111,000.00
Proceeds of sale of engineer property	540.81
By act of Congress of—	
March 3, 1903 (sundry civil act), allotted	47,000.00
Proceeds of sale of engineer property	5,351.74
Proceeds of sale of engineer property	1,018.80
Received for injuries to barge	18.00
By act of Congress of—	
April 28, 1904 (sundry civil act), allotted	38,000.00
March 3, 1905 (sundry civil act), allotted	45,000.00
June 30, 1906 (sundry civil act), allotted	55,000.00
March 2, 1907 (river and harbor act), allotted	65,000.00
Proceeds of sale of engineer property	570.95
Total	501,500.30

7. Surveys, Gauges, and Observations.

During the year the annual surveys called for by resolutions of the Mississippi River Commission were made at Kempe Bend, Giles Bend, Old River, sill dams in the Atchafalaya River, and in New Orleans Harbor at Carrollton Bend and Third District reach. Survey of Gretna-Gouldsboro-Algiers Point was commenced, but was interrupted by high water. In addition to these, special surveys were ordered in Marengo Bend and Natchez Harbor and at Amesville in

New Orleans Harbor. Of these surveys only those in New Orleans Harbor and at Natchez and Marengo Bend were charged to the regular allotment for surveys the cost of the others being charged to the works in progress.

The gauge at Barbres Landing, at the junction of the Red and Atchafalaya rivers, was maintained as heretofore.

Remarks on the conditions developed by the surveys will be found in the reports on the works at the various localities. The results of the surveys at Natchez and Marengo Bend and at Amesville were made the subjects of special reports, as directed by the resolutions of the Commission providing for these surveys.

The amount expended from June 30, 1906, to June 30, 1907, is $5,096.25, distributed as follows:

Office expenses (main office)		$169.03
Other administrative expenses		225.00
Field work and drafting:		
Materials	$307.02	
Wages	2,997.12	
Subsistence	1,136.49	
		4,440.63
Repairs to plant		64.88
Care of plant		6.98
New plant		29.38
Maintenance, Barbres gauge		151.50
Miscellaneous		8.85
Total		5,096.25

In compliance with resolution of the Commission, adopted April 9, 1906, there should be added to the above total cost for the year $157.23 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration.

ABSTRACT OF APPROPRIATIONS.

Surveys, gauges, and observations.

"Survey unleveed front, fourth district:"	
By act of Congress of August 2, 1882 (river and harbor act), allotted	$1,000.00
"Survey Cubbitts Gap and vicinity:"	
By act of Congress of August 2, 1882 (river and harbor act), allotted	[a] 137.14
"Observations at Carrollton, La.:"	
By act of Congress of—	
August 2, 1882 (river and harbor act), allotted	3,000.00
March 3, 1883 (river and harbor act), allotted	1,500.00
	4,500.00
"Discharge observations:"	
By act of Congress of August 11, 1888 (river and harbor act), allotted	9,000.00
"Gauges:"	
By act of Congress of August 11, 1888 (river and harbor act), allotted	2,000.00
"Surveys, examinations, and contingencies:"	
By act of Congress of—	
August 11, 1888 (river and harbor act), allotted	1,000.00
August 11, 1888 (river and harbor act), allotted	3,000.00
	4,000.00

[a] Original allotment, $300; $162.86 transferred to New Orleans Harbor.

"Surveys, gauges, and observations:"

By act of Congress of—	
September 19, 1890 (river and harbor act), allotted	$12,000.00
September 19, 1890 (river and harbor act), allotted by transfer	1,000.00
July 13, 1892 (river and harbor act), allotted	12,000.00
March 3, 1893 (sundry civil act), allotted	12,000.00
August 18, 1894 (sundry civil act), allotted	12,000.00
March 2, 1895 (sundry civil act), allotted	10,000.00
June 3, 1896 (river and harbor act), allotted	500.00
March 3, 1899 (sundry civil act), allotted	5,000.00
June 6, 1900 (sundry civil act), allotted	5,000.00
June 6, 1900 (sundry civil act), allotted	1,000.00
June 13, 1902 (river and harbor act), allotted	5,000.00
March 3, 1903 (sundry civil act), allotted	6,000.00
April 28, 1904 (sundry civil act), allotted	5,000.00
March 3, 1905 (sundry civil act), allotted	5,000.00
June 30, 1906 (sundry civil act), allotted	5,000.00
Received from sales, blueprints	.50
	96,500.50
Grand total	117,137.64

8. Levees.

For work of levee construction and maintenance the fourth district, improving Mississippi River, is subdivided into seven levee districts. For limits of the districts, see current summary; also Plates VI to XI, inclusive, herewith. The plates show locations of all levees, whether built by State authorities or by the United States, levees completed during the year and those still under contract by the United States, profiles of the levee line, of the high waters of 1897, 1903, and 1907, and the approved Mississippi River Commission grade. These plates also show the general location of the several works of bank protection.

On July 1, 1906, the amount of levee work required to complete the contracts then in force was 1,437,756 cubic yards, at an average cost of 23.56 cents per cubic yard.

Under project, approved July 16, 1906, for the expenditure of the allotments from the sundry civil act of June 30, 1906, together with the balance of former allotments, contracts were entered into during the year for 979,176 cubic yards of levee work, at an average cost of 27.52 cents. The apparent increase of the average cost over that of recent years is due to the fact that over 1,259,205 cubic yards are included in the new Bougere levee, which is under construction through a densely wooded swamp, where the conditions render levee building most difficult and costly.

Construction.—The river attained a sufficient elevation early in January to seriously interfere with all levee construction, and by January 21 work was suspended at several localities. The high stage of the river did not, however, prevent the completion of a large amount of levee work, a considerable proportion of which was on the Bougere levee, and therefore difficult and expensive.

No muck or base ditches were cut during the past season, as all of the old embankments enlarged were known to be free from leaks and the foundations of all new levees were considered to be free from objectionable matter.

Following the custom of previous years, the tabular statements as to levee construction are for the period from May 1, 1906, to May 1, 1907. During this period the total amount of levee work completed and paid for by the United States was 1,306,705 cubic yards. The tables of completed and uncompleted levees herewith show the number of cubic yards constructed under each contract, unit prices, and percentage in place. Tables follow stating the percentage in length of existing levee system built wholly or in part by the United States, the changes in contents of the levee system during the year, with the proportion of the levees now built in each district, and the approximate present condition of the levee line in the fourth district as to grade.

Lower Tensas levee district.

[Unless otherwise stated all levees are built to a grade established by the Mississippi River Commission, and have a crown 8 feet wide with slopes of 3 on 1.]

Name of levee.	Miles below Cairo.	Date work completed.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Total cost.
Bougere:			*Feet.*	*Feet.*			*Cents.*	
Lot 2, sections 4-8.	740.0 R.	Feb. 1, 1907	1,700	18.0	New.....	83,353.80	27	$22,505.54
Lot 3, sections 7-8.	740.5 R.	Dec. 25, 1906	700	19.6	.....do.....	39,339.67	33⅓	13,113.22
Lot 4, sections 5-6.	740.5 R.	Jan. 3, 1907	600	20.4	.....do.....	35,434.90	33⅓	11,811.63
Lot 5, sections 4-8.	741.0 R.	Feb. 18, 1907	1,300	21.2	.....do.....	81,594.05	33⅓	27,669.00
Lot 6, sections 1-3. Lot 6, sections 5-8.	741.5 R.	Jan. 12, 1907	2,900	21.2	.....do.....	117,701.95	34⅓	40,410.99
Lot 7, sections 1-8.	741.5 R.	Dec. 26, 1906	2,400	19.8	.....do.....	127,899.45	27½	35,172.35
Lot 8, section 1. Lot 8, sections 3-6.	742.0 R.	Jan. 19, 1906	2,700	13.8	.....do.....	73,517.46	19	13,968.31
Lot 9, sections 1-3.	738.5 R.	Nov. 30, 1906	1,800	19.9	New and enlargement.	42,247.80	32.95	13,920.65

[Uncompleted levees, 1906-7.]

Name of levee.	Miles below Cairo.	Date of contract.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Percentage in place.
Bougere:			*Feet.*	*Feet.*			*Cents.*	
Lot 2, section 8.	739.0 R.	Aug. 30, 1905	400	19.8	New....	19,849.29	27	33 per cent.
Lot 3, sections 1-6.	740.0 R.	.....do.....	1,700	20.4	...do....	89,054.78	33⅓	No work done.
Lot 4, sections 1-4, and sections 7-8.	740.5 R.	.....do.....	1,300	20.1	...do....	88,204.40	33⅓	Do.
Lot 5, sections 1-3.	741.0 R.	.....do.....	900	20.9	...do....	49,626.18	33⅓	Do.
Lot 6, section 4.	741.5 R.	.....do.....	200	22.0	...do....	11,986.90	34⅓	Do.
Lot 8, section 2.	742.0 R.	.....do.....	300	17.8	...do....	13,260.04	19	Do.
Lot 10, sections 1-8.	739.5 R.	Oct. 17, 1906	2,245	19.1	...do....	135,000.00	32.40	Do.
Lot 12, sections 1-8.	739.5 R.	Aug. 29, 1906	1,500	23.5	...do....	120,000.00	36⅓	Do.
Lot 13, sections 1-8.	740.0 R.	.....do.....	1,700	21.8	...do....	120,000.00	36⅓	Do.
Lot 14, sections 1-8.	740.0 R.	.....do.....	1,800	20.4	...do....	120,000.00	36⅓	Do.

Atchafalaya levee district.

[Completed levees, 1906-7.]

Name of levee.	Miles below Cairo.	Date work completed.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Total cost.
Picayuneville:			*Feet.*	*Feet.*			*Cents.*	
Sections 1-16..	796 R.	Sept. 7, 1906	5,288 1,025	18.3 15.7	New and enlargement.	241,359.01	18⅞	$45,556.51
Arbroth:								
Sections 1-10..	813 R.	June 21, 1906	4,263	16.3	New.....	150,129.71	17⅞	26,085.04

Atchafalaya levee district—Continued.

[Uncompleted levees.]

Name of levee.	Miles below Cairo.	Date of contract.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Percentage in place.
			Feet.	*Feet.*			*Cents.*	
Torras: Sections 1-6...	765 R.	Dec. 26, 1906	3,228	13.9	New	75,595.99	14.70	No work done.

Lafourche levee district.

[Completed levees, 1906–7.]

Name of levee.	Miles below Cairo.	Date work completed.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Total cost.
			Feet.	*Feet.*			*Cents.*	
Waguespack: Section 3...	914.5 R	Aug. 11, 1906	2,958	11.0	New and enlargement.	18,978.43	11.97	$2,271.72

[Uncompleted levees.]

Name of levee.	Miles below Cairo.	Date of contract.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Percentage in place.
			Feet.	*Feet.*			*Cents.*	
Columbia: Sections 1-6.	923.4 R	Jan. 10, 1906	12,700	11.0	Enlargement	76,000.00	13.75	No work done.
Waterford: Sections 1-8.	932.3 R	.....do.....	16,544	9.3	New and enlargement.	102,775.90	11.43	Do.
Willswood: Sections 1-2.	951 R	.....do.....	6,143	10.5	Enlargement	25,476.92	16.50	32 per cent in place.

Barataria levee district.

[Completed levees, 1906–7.]

Name of levee.	Miles below Cairo.	Date work completed.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Total cost.
			Feet.	*Feet.*			*Cents.*	
Oakville: Section 5.....	992 R	Oct. 12, 1906	2,345	9.3	Enlargement.	12,575.73	17.40	$2,188.16
Magnolia: Section 5.....	1,017 R	Nov. 14, 1906	2,853	9.0	....do....	13,282.07	17.70	2,350.92

[Uncompleted levees.]

Name of levee.	Miles below Cairo.	Date of contract.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Percentage in place.
			Feet.	*Feet.*			*Cents.*	
Oakville: Sections 1-4..	992 R	Sept. 19, 1905	11,668	9.3	Enlargement.	52,721.52	17.40	33 per cent.
Magnolia: Sections 1-4..	1,016 R	.....do.....	12,270	9.0	.....do.....	43,428.91	17.70	14 per cent.
Socola: Sections 1-2..	1,018 R	Aug. 27, 1906	3,194	8.9	New and enlargement.	29,595.44	16.45	43 per cent.

Pontchartrain levee district.

[Completed levees, 1906–7.]

Name of levee.	Miles below Cairo.	Date work completed.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Total cost.
			Feet.	*Feet.*			*Cents.*	
Margaret: Sections 1-3....	863 L	Jan. 17, 1907	3,796	17.5	Enlargement.	34,796.74	16.50	$5,741.46
Cottage Farm: Sections 1-6....	878.5 L	Sept. 6, 1906	8,000	16.6	.....do....	78,556.53	16.50	12,961.83
Belle Helene: Sections 1-6....	879.5 L	Nov. 13, 1906	6,825	15.0	.....do....	77,826.63	16.50	12,841.39
Bourbon: Sections 3-5....	910 L	Jan. 16, 1907	4,095	12.7	.....do....	35,389.95	16.50	5,839.34
Lutcher: Section 3.....	915 L	Dec. 4, 1906	750	12.0	.....do....	6,137.67	16.50	1,012.71

[Uncompleted levees.]

Name of levee.	Miles below Cairo.	Date of contract.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Percentage in place.
			Feet.	*Feet.*			*Cents.*	
Gomez.....	855 L	Oct. 1, 1906	3,076	13.3	Enlargement.	19,418.89	18.00	No work done.
Margaret: Sections 4-5.	863 L	Aug. 28, 1905	1,792	17.5	.....do.....	23,428.11	16.50	Do.
Hermitage: Sections 1-3.	877 L	.....do.....	4,005	14.0	.....do.....	34,518.01	16.50	Do.
Burnside.....	891 L	Oct. 1, 1906	2,151	9.8	.....do.....	18,644.18	16½	Do.
Union: Sections 1-8.	894 L	.....do.....	9,892	13.4	New and enlargement.	105,469.64	15½	Do.
Bourbon: Sections 1-2.	910 L	Aug. 28, 1905	2,400	12.7	Enlargement.	24,814.48	16.50	Do.
Sarpy: Sections 1-2.	936 L	Oct. 1, 1906	2,830	13.0	.....do.....	26,609.74	39.00	16 per cent.
Pecan Grove: Sections 1-6.	941 L	.....do.....	9,812	10.9	New and enlargement.	76,742.22	14.99	No work done.

Lake Borgne levee district.

[Completed levees, 1906–7.]

Name of levee.	Miles below Cairo.	Date work completed.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Total cost.
			Feet.	*Feet.*			*Cents.*	
Bertrandville...	993 L	July 19, 1906	2,526	6.8	New and enlargement.	11,881.24	16.70	$1,984.17
Monsecour: Sections 4-5...	1,002 L	Sept. 17, 1906 / Oct. 22, 1906	2,352	11.5	.....do.....	24,702.52	17.75	4,384.70

[Uncompleted levees.]

Name of levee.	Miles below Cairo.	Date of contract.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Price per cubic yard.	Percentage in place.
			Feet.	*Feet.*			*Cents.*	
Monsecour: Sections 1-3.	1,002 L	Jan. 22, 1906	4,013	11.5	New and enlargement.	38,706.80	17.75	61 per cent.
Woodlawn: Sections 1-4.	995 L	Dec. 27, 1906	11,770	7.0	.....do.....	44,043.32	22.00	No work done.
Fairview: Sections 1-4.	999 L	.....do.....	12,041	8.2	Enlargement.	42,714.36	21.00	Do.

Percentage of length of existing levee system built wholly or in part by the United States.

Levee district.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
	Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
Lower Tensas	66	72	71	71	72	73	73	63	64	64.5
Atchafalaya	65	67	68	69	68	67.9	68	65.5	66.7	64.7
Lafourche	61	62	75	82	83	78	77.7	77.6	77.6	77
Barataria	50	54	63	55	55	55	55	56.5	55.2	62.6
Pontchartrain	75	77	80	78	78	79	80	86.9	88.2	88.7
Lake Borgne	65	66	44.5	46	46	46	44.5	49.7	48.6	54
Whole fourth district, improving Mississippi River	65	66	67.2	68.7	69	68.6	66.3	66.5	66.8	70.8

Tabulated statement showing condition of levees and levee work for period from May 1, 1906, to May 1, 1907.

Levee district.	In system.	Built.	Contents in 1906.	Built since by United States.	Built since by local authorities.	Constructed in 1907.
	Miles.	*Miles.*	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*
Lower Tensas	161.53	152.42	19,930,299	601,089	779,072	1,380,161
Atchafalaya	128.60	128.60	21,250,815	391,489	562,471	953,960
Lafourche	82.20	82.20	8,909,283	18,978	368,729	387,707
Barataria	71.88	71.88	3,216,604	25,858	44,755	70,613
Pontchartrain	125.62	125.62	16,982,213	232,707	328,709	561,416
Lake Borgne	77.08	77.08	3,748,499	36,584	58,198	94,782
Total	646.91	637.80	74,037,713	1,306,705	2,141,934	3,448,639

Levee district.	Lost during year.	Contents in 1907.	Required to complete.	Estimated final contents.	Percentage now built.
	Cub. yds.	*Cub. yds.*	*Cub. yds.*	*Cub. yds.*	
Lower Tensas	274,600	21,035,860	9,463,136	30,498,996	69
Atchafalaya	469,800	21,734,975	3,504,840	25,239,815	86
Lafourche	150,350	9,146,640	2,095,840	11,242,480	81
Barataria	6,600	3,280,617	571,231	3,851,848	85
Pontchartrain	58,552	17,485,077	4,141,821	21,626,898	81
Lake Borgne	57,800	3,785,499	676,099	4,461,598	85
Total	1,017,702	76,468,669	20,452,967	96,921,627	79

Table showing the condition of levees in the fourth district as to grade.

Levee district.	Levees.					
	Less than 1 foot above highest water.	1 to 2 feet above highest water.	2 to 3 feet above highest water.	3 to 4 feet above highest water.	Up to grade.	Total length.
	Miles.	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*
Lower Tensas	.....	.....	22.57	90.78	40.35	[a] 153.70
Atchafalaya	.....	.....	.92	7.14	120.54	128.60
Lafourche	.....	2.15	8.75	4.00	67.30	[b] 82.20
Barataria	12.20	21.47	4.70	.....	33.51	[c] 71.88
Ponchartrain	.11	2.28	4.05	17.12	102.06	[d] 125.62
Lake Borgne	11.36	22.08	5.38	.....	38.25	[e] 77.07
Total	23.67	47.98	46.37	119.04	402.01	639.07

[a] 32.43 miles included in the 90.78 miles of levee 3 to 4 feet above the highest water, are 4 feet or more above the highest water, but below grade.

[b] The grade in this district varies from 2.9 to 4.2 feet above the highest water. The length given from 3 to 4 feet is below grade.

[c] Referred to 1903 high water. Of the 33.51 miles up to grade, 27.14 miles are less than 3 feet above 1903 high water.

[d] The grade in this district is from 3.4 to 4.6 feet above the 1897 high water. Levees given from 3 to 4 feet above highest water are those that are not to grade.

[e] Referred to 1903 high water. Of the 38.25 miles of levee that are to grade, 1.97 miles are less than 2 feet above 1903 high water, and 27.96 miles are less than 3 feet above 1903 high water.

Protection against high water.—On January 21 the river throughout the district was at a bank-full stage, and the gauge at Cincinnati registered 65.1. The indications therefore were that a flood stage would be reached in the lower river in a few weeks. In anticipation of high water, emergency work, sacks, lumber, nails, wheelbarrows, and other tools were loaded on barges and these barges stationed at the most accessible points throughout the district, so as to be immediately available in case of emergency. Several of the tugs were put in commission for the purpose of towing the barges. In the lower Tensas levee district, at Bougere (738 R), the ends of the new levee being constructed by the United States at that point are protected by the embankment of the Texas and Pacific Railway, under construction. The early rise of the river prevented the completion of the railway embankment, and on January 22 a Government quarter boat, with a force of laborers, was moved to Bougere to assist the railway forces in maintaining a small protection levee near the river bank until the railway embankment could be secured. The protection levee was breached on January 27, and thereafter the Government forces assisted in protecting the railway embankment in the immediate vicinity of where it joins the levee. The holding of this embankment was essential to the protection of a part of the United States levee. The only other protection work required was the capping of some of the levees in the Lake Borgne and Barataria districts.

On January 31 a break occurred in the levee on the upper end of Davis Island (620 R). Subsequently the river reached a stage 2 or more feet higher than the top of the levee in the vicinity of the break.

On the night of February 21 a break occurred in the levee line of the Barataria district, on Live Oak plantation (991 R). Owing to the very narrow batture or foreshore at this point it was decided by the local authorities not to attempt to close the crevasse on the river side, as is the general practice. The upper and lower ends of the break were temporarily protected, and as the river was falling, it was decided to wait until it had declined to 16 feet on the New Orleans gauge before attempting the work of closure. Operations to close the crevasse on the land side were commenced on March 6, and the break was successfully closed on March 23. The United States aided in this work to the extent of furnishing the use of two barges, three quarter boats, and a tug.

During the height of the flood the river ran through five of the seventeen breaks in the levee line of the Lake Borgne district made by the tropical storm of September 26–27, 1906. No attempt was made to close these breaks which extend from about 5 miles above to 1 mile below Fort St. Philip.

Repairs.—In the lower Tensas district the slopes of lot 2, Bougere levee (738 R), which had been wave washed were restored by hired teams at a cost of $71.

In the Atchafalaya district at Picayuneville levee (769 R) a drainage ditch containing 10,554.97 cubic yards was cut at a total cost of $1,477.

In the Pontchartrain district the drainage ditches at Southwood levee (875 L) were not satisfactorily completed and therefore have not been accepted.

Abandoned levees.—The following table gives the history of each levee abandoned by the construction of new levees from May 1, 1906, to May 1, 1907:

Name.	Miles below Cairo.	District.	Length.	By whom built.	When built.	By whom last enlarged.	When last enlarged.
			Feet.				
Palmyra	619-R	Lower Tensas	1,832	U. S.	1893	State	1897
Sycamore	695-R	do	881 10,107	State do.	1903 1881	..... State	 1903
Green	720-R	do	800	State U. S.	1904 1887	..... State	 1902
Picayuneville	796-R	Atchafalaya	231 4,957	State do.	1895 1886	..... U. S.	 1906
Arbroth	811-R	do	3,760 490	State U. S.	1890 1891	State	1901
Medora	852-R	do	607 398	U. S. State	1895 1889	State do.	1901 1901
Plaquemine	854-R	do	1,615	State	1888	State	1904
Nodaway	868-R	do	364 2,712	State do.	1893 1884	State	1904
Whitecastle	870-R	do	2,065	U. S.	1894	State	1904
Smoke Bend	885-R	do	802 130	U. S. State	1896 1897	State do.	1898 .....
Carroll	916-R	Lafourche	1,127 923	State U. S.	1880 1895	State U. S.	1902 .....

Name.	Miles below Cairo.	District.	Length.	By whom built.	When built.	By whom last enlarged.	When last enlarged.
			Feet.				
Stevenson	919-R	Lafourche	4,148	State	(a)	United States	1899
Orange Farm	1,023-R	Barataria	1,651	Not known	(b)	State	1903
Diamond	931-L	Pontchartrain	3,251	State	1878	United States	1896
Southport	957-L	do	613	State	1884		
Bertrandville	990.5-L	Lake Borgne	2,855	Not known	(b)	United States	1896
Belair	995-L	do	4,379	State	(b)		

[a] More than twenty years ago. [b] Not known.

The number of cubic yards in the abandoned sections of levee was as follows: In the lower Tensas district, 274,600 cubic yards; in the Atchafalaya district, 469,800 cubic yards; in the Lafourche district, 150,350 cubic yards; in the Barataria district, 6,600 cubic yards; in the Pontchartrain district, 58,552 cubic yards, and in the Lake Borgne district, 57,800 cubic yards.

Supervision.—All levee work in the fourth district is under the supervision of Assistant Engineer W. E. Knobloch, assisted by Junior Engineers W. C. Barton, John Klorer, and George C. Schoenberger.

The detailed expenditures during the fiscal year and the abstracts of allotments for each levee district follow:

LOWER TENSAS LEVEE DISTRICT.

The amount expended from June 30, 1906, to June 30, 1907, is $180,937.91, distributed as follows:

Office expenses (main office)	$4,859.31
Other administrative expenses	3,736.49
Construction of levees (contract)	163,943.75
Repairs to levees	71.00
Surveys	1,982.02
Repairs to plant	8.50
New plant	37.85
Miscellaneous	17.93
Protection of levees	6,281.06
Total	180,937.91

In compliance with resolution of the Commission, adopted April 9, 1906, there should be added to the above total cost for the year $978.46 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant, during the lay-off season and at the engineer depot was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $322.50.

ABSTRACT OF APPROPRIATIONS.

Lower Tensas levee district.

"Levees, Tensas front:"

By act of Congress of—	
August 2, 1882 (river and harbor act), allotted	$426,160.00
January 19, 1884 (river and harbor act), allotted	21,000.00
January 19, 1884 (river and harbor act), allotted by transfer	3,000.00
July 5, 1884 (river and harbor act), allotted	90,000.00
July 5, 1884 (river and harbor act), allotted	8,710.00
July 5, 1884 (river and harbor act), allotted by transfer	3,400.00
July 5, 1884 (river and harbor act), allotted	1,000.00
August 5, 1886 (river and harbor act), allotted	11,100.00
August 5, 1886 (river and harbor act), allotted	15,000.00
August 5, 1886 (river and harbor act), allotted	150,000.00
August 11, 1888 (river and harbor act), allotted	[a] 160,000.00
	889,370.00

[a] Original allotment, $175,000; $5,000 transferred to protection of third district; $10,000 to protection, fourth district.

"Protection of levees, Tensas front:"

By act of Congress of—	
August 5, 1886 (river and harbor act), allotted	$7,000.00
August 5, 1886 (river and harbor act), allotted	6,000.00
August 11, 1888 (river and harbor act), allotted	10,000.00
	23,000.00

"Levees, Tensas basin:"

By act of Congress of—	
September 19, 1890 (river and harbor act), allotted	199,500.00
September 19, 1890 (river and harbor act), allotted by transfer	38,475.00
September 19, 1890 (river and harbor act), allotted	11,542.50
September 19, 1890 (river and harbor act), allotted by transfer	1,334.75
September 19, 1890 (river and harbor act), allotted by transfer	3,000.00
August 5, 1886 (river and harbor act), reallotted from sales	21.00
	253,873.25

"Protection of levees, Tensas basin:"

By act of Congress of—	
September 19, 1890 (river and harbor act), allotted	9,525.00
September 19, 1890 (river and harbor act), allotted by transfer	607.50
September 19, 1890 (river and harbor act), allotted by transfer	70.25
September 19, 1890 (river and harbor act), allotted by transfer	5,000.00
September 19, 1890 (river and harbor act), allotted by transfer	5,000.00
	20,202.75

"Protection of levees, fourth district:"

By act of Congress of—	
August 11, 1888 (river and harbor act), allotted	29,211.94

"Lower Tensas levee district:"

By act of Congress of—	
July 13, 1892 (river and harbor act), allotted	150,000.00
March 3, 1893 (sundry civil act), allotted	132,000.00
August 18, 1894 (sundry civil act), allotted	67,000.00
March 2, 1895 (sundry civil act), allotted	89,360.00
June 3, 1896 (river and harbor act), allotted	45,000.00
June 4, 1897 (sundry civil act), allotted	228,700.00
July 19, 1897 (deficiency act), allotted	45,000.00
July 1, 1898 (sundry civil act), allotted	158,000.00
March 3, 1899 (sundry civil act), allotted	217,300.00
June 6, 1900 (sundry civil act), allotted	110,000.00
June 13, 1902 (river and harbor act), allotted	110,000.00
March 3, 1903 (sundry civil act), allotted	110,000.00
April 28, 1904 (sundry civil act), allotted	110,000.00
March 3, 1905 (sundry civil act), allotted	110,000.00
March 3, 1905 (river and harbor act), allotted	85,000.00
June 30, 1906 (sundry civil act), allotted	235,000.00
March 2, 1907 (river and harbor act), allotted	300,000.00
Received from sales, blueprints	.50
	2,302,360.50
Grand total	3,518,018.44

ATCHAFALAYA LEVEE DISTRICT.

The amount expended from June 30, 1906, to June 30, 1907, is $32,734.84, distributed as follows:

Office expenses (main office)	$786.35
Other administrative expenses	1,345.86
Construction of levees (contract)	26,844.22
Surveys	641.15
Repairs to plant	1.00
New plant	10.00
Repairs to levees	1,477.70
Protection of levees	1,628.56
Total	32,734.84

In compliance with resolution of the Commission, adopted April 9, 1906, there should be added to the above total cost for the year $470.44 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant, during the lay-off season and at the engineer depot was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $322.50.

ABSTRACT OF APPROPRIATIONS.

Atchafalaya levee district.

"Atchafalaya front:"	
By act of Congress of—	
August 2, 1882 (river and harbor act), allotted	$110,000.00
January 19, 1884 (river and harbor act), allotted	5,000.00
January 19, 1884 (river and harbor act), allotted	4,000.00
January 19, 1884 (river and harbor act), allotted	15,000.00
January 19, 1884 (river and harbor act), allotted	[a] 2,800.00
August 3, 1886 (river and harbor act), allotted	40,000.00
	176,800.00
"Levees, right bank, below Red River:"	
By act of Congress of—	
September 19, 1890 (river and harbor act), allotted	123,975.00
September 19, 1890 (river and harbor act), allotted by transfer	41,562.50
September 19, 1890 (river and harbor act), allotted by transfer	12,468.75
September 19, 1890 (river and harbor act), allotted by transfer	1,441.15
	179,447.40
"Protection of levees, right bank, below Red River:"	
By act of Congress of—	
September 19, 1890 (river and harbor act), allotted	6,222.30
"Protection of levees, fourth district:"	
By act of Congress of—	
August 11, 1888 (river and harbor act), allotted	23,663.00
"Atchafalaya levee district:"	
By act of Congress of—	
July 13, 1892 (river and harbor act), allotted	155,000.00
March 3, 1893 (sundry civil act), allotted	152,000.00
August 18, 1894 (sundry civil act), allotted	[b] 147,366.96
March 2, 1895 (sundry civil act), allotted	[c] 148,960.00
June 3, 1896 (river and harbor act), allotted	28,125.00
June 4, 1897 (sundry civil act), allotted	138,600.00
July 19, 1897 (deficiency act), allotted	28,125.00
July 1, 1898 (sundry civil act), allotted	87,000.00
March 3, 1899 (sundry civil act), allotted	98,800.00
June 6, 1900 (sundry civil act), allotted	55,000.00
June 13, 1902 (river and harbor act), allotted	40,000.00
March 3, 1903 (sundry civil act), allotted	40,000.00
April 28, 1904 (sundry civil act), allotted	40,000.00
March 3, 1905 (sundry civil act), allotted	40,000.00
March 3, 1905 (river and harbor act), allotted	30,000.00
June 30, 1906 (sundry civil act), allotted	25,000.00
March 2, 1907 (river and harbor act), allotted	30,000.00
	1,283,976.96
Grand total	1,670,109.66

[a] Original allotment, $12,000; $9,200 transferred to Tensas front, New Orleans Harbor, and mouth of Red River.

[b] Original allotment, $152,000; $4,633.04 transferred to Pontchartrain levee district.

[c] Original allotment, $152,000; $3,040 transferred to Homochitto levee district.

LAFOURCHE LEVEE DISTRICT.

The amount expended from June 30, 1906, to June 30, 1907, is $6,309.89, distributed as follows:

Office expenses (main office)	$422.91
Other administrative expenses	1,084.83
Construction of levees (contracts)	2,789.40
Surveys	366.00
Protection of levees	1,646.75
Total	6,309.89

In compliance with resolution of the Commission adopted April 9, 1906, there should be added to the above total cost for the year $434.31 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant for care and repair of plant during the lay-off season and at the engineer depot was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $322.50.

ABSTRACT OF APPROPRIATIONS.

Lafourche levee district.

"Protection of levees, right bank, below Red River:"	
By act of Congress of—	
September 19, 1890 (river and harbor act), allotted	$6,222.30
"Protection of levees, fourth district:"	
By act of Congress of—	
August 11, 1888 (river and harbor act), allotted	32,536.62
"Lafourche levee district:"	
By act of Congress of—	
July 13, 1892 (river and harbor act), allotted	90,000.00
March 3, 1893 (sundry civil act), allotted	90,000.00
August 18, 1894 (sundry civil act), allotted	90,000.00
March 2, 1895 (sundry civil act), allotted	[a] 88,200.00
June 3, 1896 (river and harbor act), allotted	8,437.50
June 4, 1897 (sundry civil act), allotted	41,600.00
July 19, 1897 (deficiency act), allotted	8,437.50
July 1, 1898 (sundry civil act), allotted	36,000.00
March 3, 1899 (sundry civil act), allotted	37,050.00
June 6, 1900 (sundry civil act), allotted	28,000.00
June 13, 1902 (river and harbor act), allotted	20,000.00
March 3, 1903 (sundry civil act), allotted	20,000.00
April 28, 1904 (sundry civil act), allotted	40,000.00
March 3, 1905 (sundry civil act), allotted	40,000.00
March 3, 1905 (river and harbor act), allotted	15,000.00
	652,725.00
Grand total	691,483.92
Other administrative expenses	1,395.01

BARATARIA LEVEE DISTRICT.

The amount expended from June 30, 1906, to June 30, 1907, is $10,798.96, distributed as follows:

Office expenses (main office)	$737.33
Other administrative expenses	1,395,01
Construction of levees (contracts)	4,923.30
Surveys	185.95
New plant	5.00
Miscellaneous	3.45
Protection of levees	3,548.92
Total	10,798.96

[a] Original allotment, $90,000; $1,800 transferred to Homochitto levee district.

In compliance with resolution of the Commission adopted April 9, 1906, there should be added to the above total cost for the year $424.25 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season and at the engineer depot was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $161.25.

ABSTRACT OF APPROPRIATIONS.

Barataria levee district.

"Protection of levees, fourth district:"	
By act of Congress of—	
August 11, 1888 (river and harbor act), allotted	$2,947.87
"Barataria levee district:"	
By act of Congress of—	
July 13, 1892 (river and harbor act), allotted	60,000.00
March 3, 1893 (sundry civil act), allotted	60,000.00
August 18, 1894 (sundry civil act), allotted	60,000.00
March 2, 1895 (sundry civil act), allotted	[a] 58,800.00
June 3, 1896 (river and harbor act), allotted	3,937.50
June 4, 1897 (sundry civil act), allotted	19,400.00
July 19, 1897 (deficiency act), allotted	3,937.50
July 1, 1898 (sundry civil act), allotted	27,000.00
March 3, 1899 (sundry civil act), allotted	24,700.00
June 6, 1900 (sundry civil act), allotted	14,000.00
June 13, 1902 (river and harbor act), allotted	10,000.00
March 3, 1903 (sundry civil act), allotted	10,000.00
April 28, 1904 (sundry civil act), allotted	15,000.00
March 3, 1905 (sundry civil act) allotted	15,000.00
March 3, 1905 (river and harbor act), allotted	15,000.00
June 30, 1906 (sundry civil act), allotted	10,000.00
March 2, 1907 (river and harbor act), allotted	25,000.00
	431,775.00
Grand total	434,722.87

PONTCHARTRAIN LEVEE DISTRICT.

The amount expended from June 30, 1906, to June 30, 1907, is $41,225.39, distributed as follows:

Office expenses (main office)	$3,264.02
Other administrative expenses	2,363.42
Construction of levees (contracts)	31,873.18
Surveys	873.77
Repairs to plant	3.50
New plant	10.00
Miscellaneous	6.60
Protection of levees	2,830.90
Total	41,225.39

In compliance with resolution of the Commission adopted April 9, 1906, there should be added to the above total cost for the year $434.51 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant for care and repair of plant during the lay-off season and at the engineer depot was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $322.50.

[a] Original allotment, $60,000; $1,200 transferred to Homochitto levee district.

ABSTRACT OF APPROPRIATIONS.

Pontchartrain levee district.

"Bonnet Carre Crevasse:"	
By act of Congress of—	
August 2, 1882 (river and harbor act), allotted	$15,000.00
"Levees left bank below Red River:"	
By act of Congress of—	
September 19, 1890 (river and harbor act), allotted	89,775.00
September 19, 1890 (river and harbor act), allotted	21,850.00
September 19, 1890 (river and harbor act), allotted	6,750.70
September 19, 1890 (river and harbor act), allotted	780.90
	119,156.60
"Protection of levees, left bank below Red River:"	
By act of Congress of—	
September 19, 1890 (river and harbor act), allotted	6,563.00
September 19, 1890 (river and harbor act), allotted by transfer	355.30
September 19, 1890 (river and harbor act), allotted by transfer	41.10
September 19, 1890 (river and harbor act), allotted by transfer	3,000.00
	9,959.40
"Protection of levees, fourth district:"	
By act of Congress of—	
August 11, 1888 (river and harbor act), allotted	15,630.57
"Pontchartrain levee district:"	
By act of Congress of—	
July 13, 1892 (river and harbor act), allotted	150,000.00
March 3, 1893 (sundry civil act), allotted	150,000.00
August 18, 1894 (sundry civil act), allotted	150,000.00
August 18, 1894 (sundry civil act), allotted by transfer	4,633.04
March 2, 1895 (sundry civil act), allotted	[a] 147,000.00
June 3, 1896 (river and harbor act), allotted	22,500.00
June 4, 1897 (sundry civil act), allotted	113,150.00
July 19, 1897 (deficiency act), allotted	22,500.00
July 1, 1898 (sundry civil act), allotted	76,000.00
March 3, 1899 (sundry civil act), allotted	74,100.00
June 6, 1900 (sundry civil act), allotted	50,000.00
June 13, 1902 (river and harbor act), allotted	101,500.00
March 3, 1903 (sundry civil act), allotted	81,500.00
April 28, 1904 (sundry civil act), allotted	90,000.00
March 3, 1905 (sundry civil act), allotted	90,000.00
March 3, 1905 (river and harbor act), allotted	60,000.00
June 30, 1906 (sundry civil act), allotted	35,000.00
March 2, 1907 (river and harbor act), allotted	120,000.00
Received from sales, blueprints	.25
	1,537,883.29
Grand total	1,697,629.86

LAKE BORGNE LEVEE DISTRICT.

The amount expended from June 30, 1906, to June 30, 1907, is $8,452.84, distributed as follows:

Office expenses (main office)	$303.95
Other administrative expenses	634.01
Construction of levees (contracts)	5,640.40
Surveys	101.91
New plant	6.30
Repairs to levees	200.61
Miscellaneous	1.40
Protection of levees	1,564.26
Total	8,452.84

[a] Original allotment, $150,000; $3,000 transferred to Atchafalaya levee district.

In compliance with resolution of the Commission adopted April 9, 1906, there should be added to the above total cost for the year $265.90 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant for care and repair of plant during the lay-off season and at the engineer depot was $32,249.76, of which the pro rata share chargeable to the above work is estimated to be $161.25.

ABSTRACT OF APPROPRIATIONS.

Lake Borgne levee district.

By act of Congress of—	
July 13, 1892 (river and harbor act), allotted	$50,000
March 3, 1893 (sundry civil act), allotted	50,000
August 18, 1894 (sundry civil act), allotted	50,000
March 2, 1895 (sundry civil act), allotted	* 49,000
June 3, 1896 (river and harbor act), allotted	4,500
June 4, 1897 (sundry civil act), allotted	22,200
July 19, 1897 (deficiency act), allotted	4,500
July 1, 1898 (sundry civil act), allotted	24,000
March 3, 1899 (sundry civil act), allotted	24,700
June 6, 1900 (sundry civil act), allotted	14,500
June 13, 1902 (sundry civil act), allotted	10,000
June 13, 1902 (sundry civil act), allotted	2,000
March 3, 1903 (sundry civil act), allotted	10,000
April 28, 1904 (sundry civil act), allotted	15,000
March 3, 1905 (sundry civil act), allotted	15,000
March 3, 1905 (river and harbor act), allotted	15,000
June 30, 1906 (sundry civil act), allotted	10,000
March 2, 1907 (river and harbor act), allotted	25,000
Total	395,400

BONDURANT CHUTE.

Money statement.

July 1, 1906, balance unexpended		$2,000.00
Amount allotted from sundry civil act approved June 30, 1906		18,000.00
Amount allotted from river and harbor act approved March 2, 1907		3,000.00
		23,000.00
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$11,180.22	
For maintenance of improvement	5,544.73	
		16,724.95
July 1, 1907, balance unexpended		6,275.05
July 1, 1907, outstanding liabilities		1.17
July 1, 1907, balance available		6,273.88

Amount (estimated) required for completion of existing project. Indeterminate.

KEMPE BEND.

Money statement.

July 1, 1906, balance unexpended	$21,506.10
Amount allotted from sundry civil act approved June 30, 1906	50,000.00
Amount allotted from river and harbor act approved March 2, 1907	12,000.00
	83,506.10

* Original allotment, $50,000; $1,000 transferred to Homochitto levee district.

June 30, 1907, amount expended during fiscal year:		
For works of improvement	$18,987.75	
For maintenance of improvement	17,179.39	
		$36,167.14
July 1, 1907, balance unexpended		47,338.96
July 1, 1907, outstanding liabilities		1,232.31
July 1, 1907, balance available		46,106.65
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$25,000.00	
For maintenance of improvement	25,000.00	
		50,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

NATCHEZ AND VIDALIA HARBORS, MISSISSIPPI AND LOUISIANA.

Money statement.

July 1, 1906, balance unexpended		$438.48
Sale of blueprints		2.10
Amount allotted from sundry civil act approved June 30, 1906		50,000.00
		50,440.58
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$21,076.80	
For maintenance of improvement	22,080.45	
		43,157.25
July 1, 1907, balance unexpended		7,283.33
July 1, 1907, outstanding liabilities		563.46
July 1, 1907, balance available		6,719.87
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$50,000.00	
For maintenance of improvement	10,000.00	
		60,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

ATCHAFALAYA AND RED RIVERS, LOUISIANA.

Money statement.

July 1, 1906, balance unexpended		$11,205.01
Settlement by Navy Department, February 6, 1907		8,666.42
		19,871.43
June 30, 1907, amount expended during fiscal year:		
For work at naval station at New Orleans, La	$174.45	
For maintenance of improvement	6,388.70	
		6,563.15
July 1, 1907, balance unexpended		13,308.28
July 1, 1907, outstanding liabilities		67.70
July 1, 1907, balance available		13,240.58
Amount (estimated) required for completion of existing project		Indeterminate.

HARBOR AT NEW ORLEANS, LA.

Money statement.

July 1, 1906, balance unexpended		$52,725.81
Sale of blueprints		.50
Amount allotted from sundry civil act approved June 30, 1906		10,000.00
		62,726.31
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$56,799.84	
For maintenance of improvement	5,709.00	
		62,508.84
July 1, 1907, balance unexpended		217.47
July 1, 1907, outstanding liabilities		205.12
July 1, 1907, balance available		12.35
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$125,000.00	
For maintenance of improvement	25,000.00	
		150,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

PLANT, FOURTH DISTRICT.

Money statement.

July 1, 1906, balance unexpended		$4,799.39
Sale of condemned property		570.95
Amount allotted from sundry civil act approved June 30, 1906		55,000.00
Amount allotted from river and harbor act approved March 2, 1907		65,000.00
		125,370.34
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$12,866.93	
For maintenance of improvement	30,929.76	
		43,796.69
July 1, 1907, balance unexpended		81,573.65
July 1, 1907, outstanding liabilities		9,026.11
July 1, 1907, balance available		72,547.54
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$50,000.00	
For maintenance of improvement	25,000.00	
		75,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899..		

SURVEYS, GAUGES, AND OBSERVATIONS.

Money statement.

July 1, 1906, balance unexpended	$1,088.82
Sale of blueprints	2.78
Amount allotted from sundry civil act approved June 30, 1906	5,000.00
	6,091.60

June 30, 1907, amount expended during fiscal year, for maintenance of improvement		$5,096.25
July 1, 1907, balance unexpended		995.35
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, for maintenance of improvement, in addition to the balance unexpended July 1, 1907		5,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

LOWER TENSAS LEVEE DISTRICT.

Money statement.

July 1, 1906, balance unexpended		$254,772.52
Refundment of overpayment		13.33
Sale of blueprint		.50
Amount allotted from sundry civil act approved June 30, 1906		235,000.00
Amount allotted from river and harbor act approved March 2, 1907		300,000.00
		789,786.35
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$180,866.91	
For maintenance of improvement	71.00	
		180,937.91
July 1, 1907, balance unexpended		608,848.44
July 1, 1907, outstanding liabilities		116.81
July 1, 1907, balance available		608,731.63
July 1, 1907, amount covered by uncompleted contracts		285,939.64
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$150,000.00	
For maintenance of improvement	10,000.00	
		160,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

ATCHAFALAYA LEVEE DISTRICT.

Money statement.

July 1, 1906, balance unexpended		$39,207.32
Amount allotted from sundry civil act approved June 30, 1906		25,000.00
Amount allotted from river and harbor act approved March 2, 1907		30,000.00
		94,207.32
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$31,257.14	
For maintenance of improvement	1,477.70	
		32,734.84
July 1, 1907, balance unexpended		61,472.48
July 1, 1907, outstanding liabilities		1.00
July 1, 1907, balance available		61,471.48
July 1, 1907, amount covered by uncompleted contracts		11,112.61
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$25,000.00	
For maintenance of improvement	5,000.00	
		30,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

LAFOURCHE LEVEE DISTRICT.

Money statement.

July 1, 1906, balance unexpended	$54,292.45
June 30, 1907, amount expended during fiscal year, for works of improvement	6,309.89
July 1, 1907, balance unexpended	47,982.56
July 1, 1907, outstanding liabilities	10.25
July 1, 1907, balance available	47,972.31
July 1, 1907, amount covered by uncompleted contracts	26,400.98
Amount (estimated) required for completion of existing project	Indeterminate.

BARATARIA LEVEE DISTRICT.

Money statement.

July 1, 1906, balance unexpended		$27,651.06
Amount allotted from sundry civil act approved June 30, 1906		10,000.00
Amount allotted from river and harbor act approved March 2, 1907		25,000.00
		62,651.06
June 30, 1907, amount expended during fiscal year, for works of improvement		10,798.96
July 1, 1907, balance unexpended		51,852.10
July 1, 1907, outstanding liabilities		7,575.00
July 1, 1907, balance available		44,277.10
July 1, 1907, amount covered by uncompleted contracts		21,341.48
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$25,000.00	
For maintenance of improvement	10,000.00	
		35,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

PONTCHARTRAIN LEVEE DISTRICT.

Money statement.

July 1, 1906, balance unexpended		$80,545.85
Sale of blueprint		.25
Amount allotted from sundry civil act approved June 30, 1906		35,000.00
Amount allotted from river and harbor act approved March 2, 1907		120,000.00
		235,546.10
June 30, 1907, amount expended during fiscal year, for works of improvement		41,225.39
July 1, 1907, balance unexpended		194,320.71
July 1, 1907, outstanding liabilities		3.34
July 1, 1907, balance available		194,317.37
July 1, 1907, amount covered by uncompleted contracts		64,147.76
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$50,000.00	
For maintenance of improvement	10,000.00	
		60,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and of section 7 of the river and harbor act of 1899.		

LAKE BORGNE LEVEE DISTRICT.

Money statement.

July 1, 1906, balance unexpended		$28,370.64
Amount allotted from sundry civil act approved June 30, 1906		10,000.00
Amount allotted from river and harbor act approved March 2, 1907		25,000.00
		63,370.64
June 30, 1907, amount expended during fiscal year:		
For works of improvement	$8,252.23	
For maintenance of improvement	200.61	
		8,452.84
July 1, 1907, balance unexpended		54,917.80
July 1, 1907, outstanding liabilities		7,578.34
July 1, 1907, balance available		47,339.46
July 1, 1907, amount covered by uncompleted contracts		25,968.47
Amount (estimated) required for completion of existing project		Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1909, in addition to the balance unexpended July 1, 1907:		
For works of improvement	$25,000.00	
For maintenance of improvement	10,000.00	
		35,000.00
Submitted in compliance with requirements of sundry civil act of June 4, 1897, and section 7 of the river and harbor act of 1899.		

COMMERCIAL STATISTICS.

By direction of the Commission, the duty of compiling the commercial statistics of the Mississippi River is assigned to the secretary of the Commission. Reference to his report is invited for the statistics of that part of the river included in the fourth district.

The following papers accompany and form part of this report:

Appendix A.—Abstract of all contracts in force during the fiscal year ending June 30, 1907.

Plate I.[a] Bondurant Chute revetment.

Plate II.[a] Kempe Bend revetment.

Plate III.[a] Giles Bend revetment.

Plate IV.[a] Part of Carrollton Bend, New Orleans Harbor.

Plate V.[a] Gouldsboro Bend, New Orleans Harbor.

Plate VI.[a] Mississippi River from Warrenton to Rifle Point (part of lower Tensas levee district).

Plate VII.[a] Mississippi River from Rifle Point to Red River Landing (parts of lower Tensas and Atchafalaya levee districts).

Plate VIII.[a] Mississippi River from Red River Landing to Point Manchac (parts of Atchafalaya and Pontchartrain levee districts).

Plate IX.[a] Mississippi River from Point Manchac to Willow Bend (parts of Atchafalaya, Lafourche, and Pontchartrain levee districts).

Plate X.[a] Mississippi River from Willow Bend to Jesuits Bend (parts of Lafourche, Barataria, Pontchartrain, and Lake Borgne levee districts).

Plate XI.[a] Mississippi River from Jesuits Bend to The Jump (parts of Barataria and Lake Borgne levee districts).

Respectfully submitted.

J. F. McINDOE,
Captain, Corps of Engineers.

Col. CLINTON B. SEARS,
Corps of Engineers, President Mississippi River Commission.

[a] Not printed.

APPENDIX A.—*Abstract of contracts in force during fiscal year ending June 30, 1907, fourth district, improving Mississippi River.*

Name of contractor.	Amount and character of work.	Unit price.	Date of approval.	Date of beginning of work.	Date of expiration of contract.
D. Tranchina	2,500 tons rock	$1.72	Aug. 15, 1905	Jan. 27, 1906	Dec. 31, 1905[ab]
Bancroft, Ross & Sinclair Co	4,500 tons rock	$2.20	Sept. 12, 1905	Oct. 3, 1906	Do.
Geo. H. Conrad	60,000 cubic yards levee work	17.4 cents	Sept. 27, 1905	Oct. 24, 1905	Feb. 1, 1906[ab]
	58,700 cubic yards levee work	17.7 cents			
Jas. A. Cleary	11,500 cubic yards levee work	16.7 cents	Oct. 2, 1905	Oct. 16, 1905	Nov. 13, 1905[ab]
Helgason Bros	244,300 cubic yards levee work	33½ cents	Sept. 13, 1905	Nov. 6, 1905	Feb. 1, 1906[ab]
	120,000 cubic yards levee work	34½ cents			
H. F. Hodge	136,800 cubic yards levee work	27 cents	Sept. 19, 1905	Sept. 21, 1905	Do.
Thomas Barr	3 creosoted barges	$4,675	Aug. 28, 1905	Sept. 9, 1905	Jan. 9, 1906[ab]
I. R. Bobbitt	124,000 cubic yards levee work	33.5 cents	Oct. 31, 1905	Oct. 24, 1905	Feb. 1, 1906[ab]
	119,500 cubic yards levee work	27.5 cents			
	115,600 cubic yards levee work	19 cents			
Hearin & Ryan	431,800 cubic yards levee work	16.5 cents	Oct. 25, 1905	Oct. 30, 1905	Mar. 10, 1906[a]
J. R. Marlow	53,000 cubic yards levee work	11.97 cents	Jan. 18, 1906	Jan. 15, 1906	June 8, 1906[ab]
Hearin & Ryan	76,000 cubic yards levee work	13.75 cents	Jan. 27, 1906	Aug. 1, 1906	Dec. 31, 1906[a]
	105,000 cubic yards levee work	11.43 cents			
	27,000 cubic yards levee work	16.50 cents			
A. Leopold	64,500 cubic yards levee work	17.75 cents	do	Jan. 29, 1906	July 16, 1906[a]
R. T. Clark	236,700 cubic yards levee work	18¾ cents	Feb. 2, 1906	Feb. 23, 1906	Nov. 27, 1906[b]
Woodward, Wight & Co	Groceries ($4,972.92)	Various	Emergency	July 21, 1906	Nov. 1, 1906[b]
Do	Vegetables ($594.12)	do	do	do	Do.
Geo. W. Davison & Co	Vegetables ($571)	do	do	do	Do.
Natchez Dressed Beef Co	Fresh meats ($2,785.40)	do	do	Aug. 1, 1906	Do.
Woodward, Wight & Co	Groceries ($5,135.96)	do	do	Aug. 16, 1906	Do.
A. Joseph	28,500 cubic yards levee work	16.45 cents	Sept. 4, 1906	Aug. 28, 1906	Dec. 1, 1906[a]
E. A. Enochs	413,000 feet, B. M., lumber	$15 per M	Emergency	Sept. 1, 1906	Nov. 1, 1906[b]
Helgason Bros	42,000 cubic yards levee work	32.95 cents	Sept. 27, 1906	Aug. 17, 1906	Jan. 21, 1907[b]
R. T. Clark & Co	362,000 cubic yards levee work	36.5 cents	do		Feb. 1, 1908
H. F. Garbish	18,600 cubic yards levee work	16¾ cents	Oct. 9, 1906	May 6, 1907	Dec. 13, 1907
	104,200 cubic yards levee work	15¾ cents			
R. T. Clark & Co	19,300 cubic yards levee work	18 cents	Oct. 18, 1906		Dec. 22, 1907
E. P. Brady	26,600 cubic yards levee work	39 cents	do	Oct. 11, 1906	Apr. 22, 1907[a]
Hearin & Ryan	76,300 cubic yards levee work	14.99 cents	Oct. 19, 1906		Jan. 1, 1908
N. Frey (Limited)	Groceries ($1,012.29)	Various	Emergency	Nov. 1, 1906	Feb. 1, 1907[b]
Do	Groceries ($4,460.38)	do	do	do	Do.
Do	Vegetables ($150.65)	do	do	do	Do.
W. H. Pritchartt & Co	Vegetables ($690.75)	do	do	do	Do.
Natchez Dressed Beef Co	Fresh meats ($2,441)	do	do	Nov. 2, 1906	Do.
Big Rock Stone and Construction Co	7,000 tons rock	$1.85	Nov. 2, 1906	Nov. 6, 1906	Dec. 31, 1906[ab]
Donovan & Daley	137,000 cubic yards levee work	32.40 cents	Nov. 9, 1906		Feb. 13, 1908
A. Leopold	86,700 cubic yards levee work	22 cents	Jan. 9, 1907		Oct. 16, 1907
Robert T. Clark	75,500 cubic yards levee work	14.7 cents	Jan. 11, 1907		July 25, 1907

[a] Time limit waived.

[b] Contract completed during the year.

INDEX.

[The references in roman are to part (or volume) and those in arabic to page.]

A.

Abbey Cut, Hudson River, N. Y., wreck near ..... I, 145; II, 1019
Aberdeen, Wash.:
  Bridge across Chehalis River ..... I, 828
  Bridge of city across Elliott Slough ..... I, 822
  Bridge across Wishkah River ..... I, 826
  Improvement of Grays Harbor and Chehalis River ..... I, 783; III, 2212
Academy Creek, Ga. (*see* Brunswick Harbor) ..... I, 319; II, 1292
Acts of 59th Congress, 2d session, affecting Corps of Engineers ..... III, 2477
Acushnet River, Mass., improvement of New Bedford Harbor ..... I, 79, 937
Adams Creek, N. C.:
  Bridge at Winthrop ..... I, 824
  Waterway via. *See* Beaufort Inlet.
Agate Bay, Minn., improvement of harbor ..... I, 585; II, 1825
Ahnapee and Western Railway Company, bridge of ..... I, 829
Ahnapee (Algoma) Harbor, Wis., improvement of ..... I, 610; III, 1881
Alabama River, Ala., improvement of ..... I, 365; II, 1357
Alabama, Tennessee and Northern Railroad Company, bridge of ..... I, 818
Alameda, Cal. *See* Oakland Harbor.
Alaska:
  Examination and survey of St. Michael Canal ..... I, 802
  Improvement of St. Michael Canal ..... I, 801; III, 2231
  Wreck in Tanana River ..... I, 802; III, 2232
Albany, N. Y., harbor lines near Van Wies Point ..... I, 814
Albany Bridge Company, bridge of ..... I, 819
Albemarle and Chesapeake Canal, N. C.:
  Improvement of waterway via ..... I, 258; II, 1213
  Purchase of (*see* Norfolk-Beaufort Inlet waterway) ..... I, 263
Albemarle Sound, N. C.:
  Bridge across ..... I, 824
  Improvement of waterway to Norfolk, Va., via Currituck Sound .. I, 258; II, 1213
  Improvement of waterway to Norfolk, Va., via Pasquotank River. I, 258; II, 1212
Algeria (schooner), wreck of ..... I, 716; III, 2096
Algoma (Ahnapee) Harbor, Wis., improvement of ..... I, 610; III, 1881
Alice (barge), wreck of ..... I, 185; II, 1103
Allegheny County, Pa.:
  Bridge across Allegheny River ..... I, 819
  Bridge across Monongahela River ..... I, 828
Allegheny River, Pa.:
  Bridge at Kennerdell ..... I, 822
  Bridge at Oakmont and Hulton Ferry ..... I, 819
  Construction of locks and dams ..... I, 548; II, 1699
  Improvement by open-channel work ..... I, 547; II, 1697
  Improvement of Pittsburg Harbor ..... I, 554; II, 1731
  Operating and care of locks and dams ..... I, 549; II, 1703
Allouez Bay, Wis. *See* Duluth Harbor.
Alloway Creek, N. J., improvement of ..... I, 191; II, 1114
Alpena Harbor, Mich., improvement of ..... I, 669; III, 1990
Altamaha River, Ga.:
  Bridge of Georgia and Florida Railway ..... I, 828
  Improvement of ..... I, 313; II, 1285
Ambrose channel, New York Harbor, N. Y., improvement of, including dredge construction ..... I, 148; II, 1025, 1106

Amelia River, Fla. *See* Fernandina.
Amite River, La., improvement of ..... I, 413; II, 1435
Anacostia River, D. C., improvement of ..... I, 232; II, 1168
Anahuac channel, Tex., improvement of ..... I, 436, 438; II, 1465
Anclote River, Fla., improvement of ..... I, 343; II, 1328, 1330
Ann, Cape, Mass., construction of harbor of refuge ..... I, 47, 903
Anne Arundel County, Md., bridges of ..... I, 827
Apalachicola Bay, Harbor, and River, Fla.:
  Improvement of harbor in bay ..... I, 349; II, 1337
  Improvement of river, including the Cut-off ..... I, 351; II, 1339
  Wreck in river ..... I, 369
Appleton, Wis.:
  See also Fox River.
  Bridge of city across United States canal ..... I, 823
Appomattox River, Va., improvement of ..... I, 255; II, 1208
Appoquinimink River, Del., improvement of ..... I, 198; II, 1123
Appropriations:
  Fortifications ..... I, 12
  Rivers and harbors ..... I, 19
Aqueduct Bridge, Washington, D. C., repair of ..... I, 830; III, 2271
Aqueduct, Washington, D. C. *See* Washington.
Aransas Bay and Pass, Tex.:
  Examination and survey for channel to Pass Cavallo (*see* Rio Grande-Mississippi River waterway) ..... I, 451
  Examination and survey for waterways from the Rio Grande to Mississippi River, via ..... I, 451
  Improvement of channel to Pass Cavallo, to Victoria (on Guadalupe River), and to Corpus Christi (via Turtle Cove) ..... I, 443; II, 1472, 1473
  Improvement of pass ..... I, 447; II, 1475
  Survey of channel to and up Guadalupe River to Victoria and to Cuero .. I, 451
  Survey of Turtle Cove channel to Corpus Christi ..... I, 451
Aransas Pass Harbor Company (*see* Aransas Pass) ..... I, 447; II, 1475
Arcadia Harbor, Mich., improvement of ..... I, 662; III, 1980
Arcata, Cal. (*see* Humboldt Harbor) ..... I, 748; III, 2149
Arkansas River:
  Bridge at Pine Bluff ..... I, 817
  Gauging (*see* Mississippi River Commission) ..... I, 812; III, 2610, 2648
  Improvement of ..... I, 473; II, 1515
Armament. *See* Fortifications.
Army War College, Washington, D. C., erection of buildings for ..... I, 859; III, 2473
Arthur Kill, N. Y. and N. J., improvement of ..... I, 157, 158; II, 1048
Arthur Lake, Mermentau River, La. (*see* Mermentau River) ..... I, 417; II, 1439
Ashland Harbor, Wis., improvement of ..... I, 593; II, 1847
Ashtabula Harbor and River, Ohio:
  Examination for extension of breakwater ..... I, 717
  Harbor lines ..... I, 815
  Improvement of ..... I, 712; III, 2088
  Wreck off ..... I, 716; III, 2096
Aspinwall, Pa., lock and dam in Allegheny River ..... I, 548, 549; II, 1699, 1703
Assistants:
  Civilian, to engineer officers ..... I, 19
  On duty in Office of the Chief of Engineers ..... I, 862
Astoria, Oreg., examination and survey of harbor ..... I, 780
Atchafalaya Basin levee board of Louisiana, lock and dam in Bayou Lafourche. I, 830
Atchafalaya River, La.:
  Bridge near Melville ..... I, 821
  Gauging (*see* Mississippi River Commission) ..... I, 812; III, 2610, 2648
  Rectification of mouth by Mississippi River Commission ..... I, 812; III, 2605
Atlantic City, N. J., wrecks off ..... I, 207; II, 1134
Atlantic City and Ocean City Railroad Company, bridge of ..... I, 823
Atlantic Highlands, N. J., examination of Sandy Hook Bay for breakwater.. I, 175
Atlantic (South) States, removal of water hyacinths from Florida waters. I, 346; II, 1333
Atlantic Ocean, wrecks off Atlantic City, N. J ..... I, 207; II, 1134
Atlantic Shore Line Railway Company, bridge of ..... I, 823
Auchmuty, Messrs. Shadle &, bridge of ..... I, 824
Augusta, Ga.:
  Improvement of Savannah River above ..... I, 310; II, 1282
  Improvement of Savannah River below ..... I, 308; II, 1279

Augusta, Minn., dam across Mississippi River ..... I, 829
Aurora, N. C., bridge across South Creek ..... I, 820
Aux Becs Scies Lake, Mich. (*see* Frankfort Harbor) ..... I, 663; III, 1981
Averas Crossing, Chickasahay River, Miss., bridge at ..... I, 823

B.

Back Bay of Biloxi, Miss. (*see* Biloxi Harbor) ..... I, 389; II, 1391
Back Cove, Portland Harbor, Me. *See* Portland Harbor.
Back Creek, Va., wreck in ..... I, 262; II, 1219
Back (Weymouth) River, Mass., improvement of ..... I, 64, 919
Back River Bridge Company, bridge of ..... I, 816
Baden (barge), wreck of ..... I, 94, 953
Bagaduce River, Me., improvement of ..... I, 25, 882
Baker (barge), wreck of ..... I, 207; II, 1134
Baldwin, Ill., bridge across Kaskaskia River ..... I, 821
Ballard, Wash. (*see* Puget Sound—Lake Washington waterway) ..... I, 791; III, 2221
Ballards Ferry, Tenn., bridge across Caney Fork River ..... I, 825
Baltimore and Ohio Railroad Company:
  Bridge across Grand River, Ohio ..... I, 824
  Bridge across Ohio River between Parkersburg, W. Va., and Belpre, Ohio. I, 828
  Bridge across Ridley Creek, Pa ..... I, 825
  Bridge across Susquehanna River ..... I, 828
Baltimore, Chesapeake and Atlantic Railway Company, bridge of ..... I, 825
Baltimore Harbor, Md.:
  Defenses of ..... I, 5
  Improvement at Spring Garden ..... I, 211; II, 1142
  Improvement of channel to ..... I, 208; II, 1137
  Improvement of channel to Curtis Bay ..... I, 210; II, 1141
Bangor Harbor, Me., improvement of Penobscot River ..... I, 26, 883
Bar Harbor, Me., construction of breakwater ..... I, 23, 879
Bar Lake, Mich. (*see* Arcadia Harbor) ..... I, 662; III, 1980
Barnstable County, Mass., bridge of ..... I, 827
Barracks, Washington, D. C. *See* Washington Barracks.
Barren River, Ky., operating and care of lock and dam ..... I, 581; II, 1810
Barry, Commodore John, monument to ..... I, 841; III, 2299
Bartholomew Bayou, La. and Ark., improvement of ..... I, 463; II, 1501
Bass River, Mass., bridge at Yarmouth and Dennis ..... I, 827
Bastrop Bayou, Tex., improvement of ..... I, 436, 440; II, 1468
Bateman, R. D. (schooner), wreck of ..... I, 288
Batteries, gun and mortar. *See* Fortifications.
Battery, the, New York Harbor, N. Y.:
  Removal of reef in North (Hudson) River, off ..... I, 150; II, 1025
  Wreck in East River, off ..... I, 145; II, 1019
Bayboro, N. C., bridge across Bay River ..... I, 823
Bay Counties Railway Company, bridges of ..... I, 820
Bay Ridge channel, New York Harbor, N. Y., improvement of ..... I, 151; II, 1034
Bay River, N. C., bridge near Bayboro ..... I, 823
Bayside channel, New York Harbor, N. Y., improvement of ..... I, 148; II, 1025
Bayside plantation, La., bridge across Bayou Teche ..... I, 828
Bear Creek, Miss., bridge across ..... I, 822
Beattyville, Ky., bridges across North and South forks of Kentucky River ..... I, 821
Beaufort Harbor, N. C.:
  Improvement of ..... I, 273; II, 1233
  Improvement of waterway to Newbern ..... I, 272; II, 1232
  Improvement of waterway to New River ..... I, 277, 279; II, 1236
Beaufort Harbor and River, S. C., improvement of waterway to Savannah (*see* Savannah Harbor) ..... I, 305; II, 1271
Beaufort Inlet, N. C.:
  Examination and survey of waterway to Norfolk, Va ..... I, 263
  Examination and survey of waterway to Pamlico Sound (*see* Norfolk-Beaufort Inlet waterway) ..... I, 263
  Improvement of ..... I, 275; II, 1235
  Improvement of waterway to Pamlico Sound ..... I, 271; II, 1231
Beaufort River, S. C. *See* Beaufort Harbor and River.
Beaumont, Miss., bridge across Leaf River ..... I, 824

Beaumont, Sour Lake and Western Railway Company, bridge of ..... I, 820
Beaverton and Willsburg Railroad Company, bridge of ..... I, 826
Bedloe (Liberty) Island, New York Bay, N. Y., examination for channel west of Robbins reef light-house to Kill van Kull ..... I, 175
Bee Tree shoals, Tennessee River, Ala., improvement of ..... I, 528; II, 1630
Bejeau Lake, La., bridge across ..... I, 821
Bellaire, Ohio:
See also Ohio River.
Bridge across Ohio River ..... I, 819
Bellaire, Benwood and Wheeling Bridge Company, bridge of ..... I, 819
Belle Isle bridge, Detroit River, Mich., wreck above ..... I, 698; III, 2057
Belle River, La., removal of water hyacinths ..... I, 427; II, 1450
Belle River, Mich., improvement of ..... I, 682; III, 2003
Bellhaven, N. C., bridge across Pungo River ..... I, 821
Bellingham Bay and Harbor, Wash.:
Harbor lines in I and J streets waterway ..... I, 815
Improvement of Whatcom Creek waterway (New Whatcom Harbor) ..... I, 797; III, 2225
Belpre, Ohio:
Bridge across Ohio River to Parkersburg, W. Va., construction of ..... I, 818
Bridge across Ohio River to Parkersburg, W. Va., obstructing navigation. I, 828
Beltrami Electric Light and Power Company, dam of ..... I, 830
Belzoni, Miss., bridge across Yazoo River ..... I, 817
Bemidji, Minn., dam in Mississippi River ..... I, 830
Bennett, J. W. (tug), wreck of ..... I, 624; III, 1915
Benton Harbor Canal, Mich. (*see* St. Joseph Harbor) ..... I, 640; III, 1947
Benwood, W. Va.:
See also Ohio River.
Bridge across Ohio River ..... I, 819
Bergen Point light, N. J., examination and survey of reef at ..... I, 175
Berrien Springs, Mich.:
See also St. Joseph River.
Dam across St. Joseph River near ..... I, 830
Berrien Springs Power and Electric Company, dam of ..... I, 830
Beverly Harbor, Mass., improvement of ..... I, 51, 905
Big Barren River, Ky., operating and care of lock and dam ..... I, 581; II, 1810
Big Fork and International Falls Railway Company, bridge of ..... I, 826
Big Fork River, Minn.:
Bridge across ..... I, 820
Examination of ..... I, 511
Big Hay Harbor, Fishers Island, N. Y., examination and survey ..... I, 118
Big Kanawha River, W. Va.:
Improvement of ..... I, 562; II, 1749
Operating and care of locks and dams ..... I, 563; II, 1750
Big Sandy River, W. Va. and Ky.:
Bridge across Levisa Fork at Prestonsburg, Ky ..... I, 826
Bridge across Tug Fork at Williamson, W. Va ..... I, 819
Improvement of, including Tug and Levisa forks ..... I, 565; II, 1771
Operating and care of locks and dams ..... I, 568; II, 1775
Big Sarasota Bay, Fla., improvement of ..... I, 338; II, 1321
Big Sioux River, S. Dak., ice harbor at Sioux City, Iowa ..... I, 511; II, 1595
Big Stone Lake, Minn., survey of ..... I, 509; II, 1593
Big Stony Island, Hudson River, N. Y., harbor lines ..... I, 814, 815
Big Sunflower River, Miss.:
Bridge at Lehrton ..... I, 817
Bridge in Sharkey County ..... I, 817
Improvement of ..... I, 469, 471; II, 1510
Bijeau Lake, La., bridge across ..... I, 821
Biloxi Harbor, Miss., improvement of ..... I, 389; II, 1391
Biscayne Bay, Fla., improvement of ..... I, 332; II, 1313
Bismarck Harbor, N. Dak. (*see* Missouri River) ..... I, 511; II, 1595
Black Lake, Mich., improvement of Holland Harbor ..... I, 647; III, 1956
Black Mingo Bridge, S. C., bridge across Mingo Creek ..... I, 826
Black Mingo Creek, S. C.:
Bridge across ..... I, 826
Improvement of ..... I, 296; II, 1260

Black River, Ark. and Mo., improvement of ..... I, 481; II, 1528
Black River, La., improvement of ..... I, 461; II, 1497
Black River, Mich.:
Improvement at mouth ..... I, 675; III, 1998
Improvement at Port Huron ..... I, 680; III, 2002
Black River, N. C., improvement of ..... I, 281; II, 1242
Black River, Lorain, Ohio, improvement of ..... I, 706; III, 2074
Black Rock Harbor, Conn. (*see* Bridgeport Harbor) ..... I, 108, 972
Black Rock Harbor, N. Y.:
Improvement of ..... I, 724; III, 2110
Improvement of Buffalo entrance ..... I, 723; III, 2110
Improvement of Lake Erie entrance ..... I, 722; III, 2108
Black Warrior River, Ala.:
Bridge across Locust Fork near Short Creek ..... I, 824
Improvement above Tuscaloosa ..... I, 373; II, 1370
Improvement below Tuscaloosa ..... I, 374; II, 1371
Operating and care of locks and dams ..... I, 382; II, 1379
Blackwater Creek, or River, Va.:
Bridge at South Quay ..... I, 823
Improvement of ..... I, 260; II, 1216
Blackwater River, Fla., improvement of ..... I, 360; II, 1350
Block Island, R. I.:
Construction of harbor of refuge ..... I, 91, 949
Improvement of Great Salt Pond ..... I, 92, 951
Wreck near entrance to Great Salt Pond ..... I, 94, 954
Blood River, La. (*see* Tickfaw River) ..... I, 412; II, 1434
Bloody Point light-house, Md., wreck near ..... I, 228
Boards (*see also* Commissions):
National Coast Defense Board ..... I, 5
Of Engineers for Rivers and Harbors ..... I, 807; III, 2241
On Fortifications or other Defenses (Endicott Board) ..... I, 5
The Board of Engineers ..... I, 5, 865
Boats. *See* Dredge boats *and* Wrecks.
Boeuf River, La., improvement of ..... I, 463, 464; II, 1502
Bogue Chitto, La., improvement of ..... I, 410; II, 1432
Bogue Falia, La., improvement of ..... I, 411; II, 1433
Bogue Sound, N. C., improvement of waterways via ..... I, 277, 279; II, 1236
Bonnie Doon (barkentine), wreck of ..... I, 94, 953
Booms, building of ..... I, 829
Boston and Maine Railroad Company, bridge of ..... I, 827
Boston Harbor, Mass.:
See also Dorchester Bay *and* Malden, Mystic, *and* Neponset rivers.
Defenses of ..... I, 5
Improvement of ..... I, 56, 910
Bow Arrow Point, Lake Champlain, Vt., bridge across "The Gut" ..... I, 828
Bowie Lumber Company (Limited), bridge of ..... I, 821
Brabsons Ferry, Holston River, Tenn., bridge at ..... I, 821
Braden Creek, Fla., bridge across ..... I, 822
Brandywine Creek, or River, Del. (*see* Wilmington Harbor) ..... I, 196; II, 1118
Branford, Conn., improvement of harbor ..... I, 101, 963
Branford, Fla., bridge across Suwanee River ..... I, 820
Braxton County, W. Va., bridge of ..... I, 820
Brazos River, Tex.:
See also Galveston and Brazos Canal.
Examination and survey between Aransas Bay and Sabine Pass (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Examination and survey of waterway to Galveston (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Improvement between Old Washington and Waco ..... I, 452; II, 1483
Improvement between Velasco and Old Washington ..... I, 453; II, 1485
Improvement of mouth ..... I, 446; II, 1474
Improvement of waterway to Galveston ..... I, 443; II, 1471
Brazos River Channel and Dock Company (*see* Brazos River) ..... I, 446; II, 1474
Brazos Santiago Harbor, Tex., improvement of ..... I, 449; II, 1476
Breton Bay, Md., improvement of ..... I, 233; II, 1171
Bridge Creek Landing, Va., wharf and monument ..... I, 841; III, 2299

Bridgeport Harbor, Conn.:
Examination and survey of outer harbor ..... I, 118
Harbor lines in, including Yellow Mill channel ..... I, 814
Improvement of ..... I, 108, 972
Wrecks in Johnsons Creek, or River ..... I, 117, 982
Bridges:
Alteration of, obstructing navigation ..... I, 828
Aqueduct Bridge, Washington, D. C., repair of ..... I, 830; III, 2271
Construction of, across navigable waters ..... I, 816, 819
Highway bridge, Washington, D. C., replacing Long Bridge ..... I, 832; III, 2273
Mississippi River, between Fort Snelling and St. Paul, Minn ..... I, 861; III, 2475
Rules governing opening of draws ..... I, 815
Yellowstone National Park, construction, etc., in ..... I, 856; III, 2461
Broad Creek River, Del., improvement of ..... I, 226; II, 1158
Broadkill Creek, or River, Del.:
Examination and survey ..... I, 208
Improvement of ..... I, 206; II, 1133
Broad Sound, Boston Harbor, Mass., improvement of ..... I, 56, 910
Bronx River, N. Y., improvement of ..... I, 122; II, 988
Brooklyn, N. Y. *See* New York Harbor.
Brooklyn Rapid Transit Company, bridges of ..... I, 822
Brooks, James N. (tug), wreck of ..... I, 624; III, 1916
Brothertown Harbor, Wis. (*see* Fox River) ..... I, 622; III, 1907
Broussard, Dormas, Crossing, Vermilion Bayou, La., bridge at ..... I, 826
Browns Creek, N. Y., improvement of ..... I, 135; II, 1004
Brownsville, Pa., harbor lines in Monongahela River ..... I, 815
Brunot Island, Ohio River, Pa., harbor lines ..... I, 815
Brunswick Harbor, Ga., improvement of ..... I, 319; II, 1292
Brunswick River, N. C. (*see* Cape Fear River) ..... I, 284; II, 1246
Brush (or Bush) Creek, Va., dredging of, in connection with Jamestown Exposition ..... I, 247; II, 1195
Buck Rapids, Missouri River, Mont., dam in vicinity of ..... I, 829
Bucksport, Me., improvement of harbor ..... I, 27, 884
Budd Inlet, Wash. *See* Olympia Harbor.
Buena Ventura (barge), wreck of ..... I, 117, 982
Buffalo Bayou, Tex., improvement of ..... I, 434; II, 1461
Buffalo Creek, or River, N. Y. *See* Buffalo Harbor.
Buffalo Harbor, N. Y.:
Examination and survey of channels in waters connecting Great Lakes ..... I, 698
Improvement of ..... I, 720; III, 2103
Improvement of Black Rock Harbor and channel ..... I, 724; III, 2110
Improvement of Buffalo entrance to Erie Basin and Black Rock Harbor. I, 723; III, 2110
Improvement of channels in waters connecting Great Lakes. I, 685; III, 2007, 2059
Improvement of Lake Erie entrance to Erie Basin and Black Rock Harbor. I, 722; III, 2108
Buffalo River, or Creek, N. Y. *See* Buffalo Harbor.
Buffalo Valley, Tenn., bridge across Caney Fork River ..... I, 824
Buildings:
Army War College ..... I, 859; III, 2473
Engineer School of Application ..... I, 859, 860; III, 2473
Public, District of Columbia ..... I, 841; III, 2299
Bulkhead lines, establishment of ..... I, 814
Bullis, Spencer S., annulment of contract with ..... I, 390; II, 1392
Burlington Harbor, Vt., improvement of ..... I, 72, 924
Burnhams Canal, Milwaukee, Wis., bridge across ..... I, 823
Burr Creek, Conn. (*see* Bridgeport Harbor) ..... I, 108, 972
Bush (or Brush) Creek, Va., dredging of, in connection with Jamestown Exposition ..... I, 247; II, 1195
Buzzards Bay, Mass., wreck off Mishaum Point ..... I, 94, 953
Byram River, N. Y. (*see* Port Chester Harbor) ..... I, 118; II, 983

C.

Cabanosso (Grand) Bayou, La., bridge across ..... I, 821
Cable galleries. *See* Fortifications.

Cache River, Ark.:
Bridge at Cottonplant ..... I, 827
Examination from lower line of Jackson County to upper line of Greene County ..... I, 486
Improvement of ..... I, 480; II, 1527
Caddo (Fairy) Lake, Tex. and La. *See* Cypress Bayou.
Calaveras River, Cal. (*see* Stockton and Mormon channels) ..... I, 744; III, 2146
Calcasieu Lake, River, and Pass, La.:
Bridge across river ..... I, 825
Improvement of mouth and passes of river ..... I, 419; II, 1440
Removal of water hyacinths ..... I, 427; II, 1450
California Débris Commission, with report on future operations. I, 809; III, 2253, 2262
Caloosahatchee River, Fla.:
Bridge at Denaud ..... I, 827
Improvement of ..... I, 337; II, 1319
Calumet Harbor, Wis. (*see* Fox River) ..... I, 622; III, 1907
Calumet Harbor and River, Ill. and Ind.:
Bridge near East Chicago and Gary, Ind ..... I, 818
Bridge near forks of river ..... I, 818
Bridge at Hammond, Ind ..... I, 818
Improvement of harbor (South Chicago Harbor) ..... I, 628; III, 1924
Improvement of river ..... I, 629; III, 1926
Reversing flow of river ..... I, 631
Cambridge, Md., improvement of harbor ..... I, 217; II, 1148
Camden, Me., improvement of harbor at ..... I, 28, 885
Camden, N. J.:
Improvement of Cooper Creek ..... I, 186; II, 1108
Improvement of Delaware River ..... I, 176, 181; II, 1079, 1100
Canada, Dominion of:
Commerce through St. Marys Falls Canal, Ont ..... I, 690; III, 2016
Transmission of electrical power into U. S. at Niagara Falls. I, 854, 855; III, 2457
Canals, locks, and dams (*see also* Waterways):
Albemarle and Chesapeake Canal, N. C., waterway via ..... I, 258, 263; II, 1213
Allegheny River, Pa., locks and dams ..... I, 548, 549; II, 1699, 1703
Appropriation for operation and care ..... I, 19
Augusta, Minn., dam in Mississippi River ..... I, 829
Barren River, Ky., lock and dam ..... I, 581; II, 1810
Bee Tree Shoals Canal, Ala ..... I, 528; II, 1630
Bemidji, Minn., dam in Mississippi River ..... I, 830
Benton Harbor Canal, Mich. (*see* St. Joseph Harbor) ..... I, 640; III, 1947
Berrien Springs, Mich., dam in St. Joseph River ..... I, 830
Big Barren River, Ky., lock and dam ..... I, 581; II, 1810
Big Kanawha River, W. Va., locks and dams ..... I, 562, 563; II, 1749, 1750
Big Sandy River, W. Va. and Ky., locks and dams ..... I, 565, 568; II, 1771, 1775
Big Stone Lake, Minn., reservoir dam ..... I, 509; II, 1593
Black Rock Harbor, N. Y., lock ..... I, 724; III, 2110
Black Warrior River, Ala., locks and dams ..... I, 373, 374, 382; II, 1370, 1371, 1379
Boston, Mass., dam in Mystic River at Medford ..... I, 829
Brazos River, Tex., locks and dams ..... I, 452; II, 1483
Buck Rapids, Missouri River, Mont., dam ..... I, 829
Burnhams Canal, Milwaukee, Wis., bridge ..... I, 823
Calaveras River, Cal., to Mormon Channel, San Joaquin River .. I, 744; III, 2146
Canadian canal, St. Marys River, Ont., commerce ..... I, 690; III, 2016
Cape Fear River above Wilmington, N. C., locks and dams ..... I, 282; II, 1244
Care and maintenance, appropriation for ..... I, 19
Cascades Canal, Columbia River, Oreg. ..... I, 764, 766; III, 2176, 2177
Chesapeake and Delaware Canal, Md. and Del ..... I, 228
Chicago (Lockport), Ill., to St. Louis, Mo., and thence to the Gulf, 14-foot waterway ..... I, 634, 812; III, 1933, 2657
Choctawhatchee River, dam near Newton, Ala ..... I, 830
Club Creek, Ga., to Plantation Creek ..... I, 319; II, 1291
Clubfoot and Harlowe Canal, N. C. waterway via ..... I, 272; II, 1232
Colbert Shoals Canal, Ala ..... I, 528; II, 1630
Columbia River, Cascades Canal ..... I, 764, 766; III, 2176, 2177
Columbia River, The Dalles Rapids to Celilo Falls, locks and canal. I, 762; III, 2171
Congaree River, S. C., lock and dam ..... I, 301, 302; II, 1264, 1265
Conowingo, Md., dam in Susquehanna River ..... I, 830
Coosa River, Ga. and Ala., locks and dams ..... I, 367, 368, 369; II, 1359, 1363

Canals, locks, and dams—Continued.
Cumberland River, Tenn. and Ky., locks and dams ..... I, 519, 521, 524; II, 1610, 1613, 1618
Dams, permits for erection of ..... I, 829
Delaware and Chesapeake Canal, Del. and Md ..... I, 228
Des Moines Rapids Canal, Mississippi River ..... I, 494; II, 1568
Des Plaines River, Ill., 14-foot waterway via ..... I, 634, 812; III, 1933, 2657
Dismal Swamp Canal, Va. and N. C., waterway via ..... I, 258; II, 1212
Duluth Canal, Minn ..... I, 586; II, 1827
Elk River Shoals Canal, Ala ..... I, 528, 531; II, 1639
Estherville-Minim Creek Canal, S. C ..... I, 297; II, 1260
Expenditures for operation and care ..... I, 19, 20
Fosters Meadow (Hook Creek) Canal, N. Y., bridge ..... I, 822, 825
Fox River, Wis., bridge at Appleton ..... I, 823
Fox River, Wis., locks and dams ..... I, 622, 623; III, 1907, 1909
Galena River, Ill, lock and dam ..... I, 496; II, 1574
Galveston and Brazos Canal, Tex. (*see also* West Galveston Bay, etc.) ..... I, 436, 442, 443, 451; II, 1470, 1471
Grand Rapids, Wabash River, lock and dam ..... I, 576, 578; II, 1805, 1807
Great Kanawha River, W. Va., locks and dams ..... I, 562, 563; II, 1749, 1750
Green River, Ky., locks and dams ..... I, 580, 581; II, 1809, 1810
Hales bar, Tennessee River, lock and dam ..... I, 528; II, 1628
Hook Creek (Fosters Meadow) Canal, N. Y., bridge ..... I, 822, 825
Illinois and Mississippi Canal, Ill., construction of ..... I, 637; III, 1940
Illinois and Mississippi Canal, Ill., operating and care ..... I, 495; II, 1572
Illinois and Mississippi Canal, Ill., pool between Locks 29 and 35, Rock River ..... I, 495; II, 1573
Illinois River, Ill., locks and dams ..... I, 635, 637; III, 1935, 1938
Illinois River, Ill., 14-foot waterway from Lockport (Chicago) to St. Louis, Mo., and thence to mouth of the Mississippi . I, 634, 812; III, 1933, 2657
Kampsville lock and dam, Illinois River, Ill ..... I, 635, 637; III, 1935, 1938
Kanawha River, W. Va., locks and dams ..... I, 562, 563; II, 1749, 1750
Kentucky River, Ky., lock and dams ..... I, 568, 569; II, 1781, 1785
Keokuk (Des Moines Rapids) Canal, Mississippi River ..... I, 494; II, 1568
Keweenaw Bay to Lake Superior ..... I, 597, 599; II, 1853
Lafourche Bayou, La., lock and dam of State levee boards ..... I, 830
Lagrange lock and dam, Illinois River, Ill ..... I, 635, 637; III, 1935, 1938
Lake Washington Canal, Wash. *See* Puget Sound—Lake Washington waterway, *infra*.
Levisa Fork, Big Sandy River, Ky., locks and dams ..... I, 565; II, 1771
Little Kanawha River, W. Va., locks and dams ..... I, 560, 562; II, 1743, 1746
Lockport, Ill., to St. Louis, Mo., and thence to mouth of the Mississippi, 14-foot waterway ..... I, 634, 812; III, 1933, 2657
Louisville and Portland Canal ..... I, 570, 575; II, 1795, 1800
Medford, Mass., dam in Mystic River ..... I, 829
Michigan Lake to Sturgeon Bay ..... I, 608, 610; III, 1874, 1880
Michigan Lake to St. Louis, Mo., and thence to the Gulf, 14-foot waterway ..... I, 634, 812; III, 1933, 2657
Minim Creek-Estherville Canal, S. C ..... I, 297; II, 1260
Mississippi River at Augusta, Minn., dam ..... I, 829
Mississippi River at Bemidji, Minn., dam ..... I, 830
Mississippi River, Des Moines Rapids Canal ..... I, 494; II, 1568
Mississippi River to Illinois River. *See* Illinois and Mississippi Canal, *supra*.
Mississippi River, Moline, Ill., lock and dam ..... I, 495; II, 1570
Mississippi River, reservoirs ..... I, 499, 502; II, 1581, 1584
Mississippi River at Rock Island Rapids, Iowa, dam ..... I, 830
Mississippi River, St. Paul to Minneapolis, locks and dams ..... I, 497; II, 1578
Mississippi River at Sauk Rapids, Minn., dam ..... I, 830
Mississippi River, 14-foot waterway from mouth to St. Louis, Mo., and thence to Lockport (Chicago), Ill ..... I, 634, 812; III, 1933, 2657
Missouri River, Buck Rapids, Mont., dam ..... I, 829
Moline Harbor, Ill., lock and dam ..... I, 495; II, 1570
Monongahela River, locks and dams ..... I, 542, 543, 546; II, 1679, 1681, 1687
Morgan Canal, Tex ..... I, 436; II, 1464
Mormon Channel, San Joaquin River, Cal., to Calaveras River .. I, 744; III, 2146
Mosquito Creek Canal, S. C. (*see* Santee River) ..... I, 297; II, 1260

Canals, locks, and dams—Continued.
Muscle Shoals Canal, Ala. I, 528, 531; II, 1627, 1639
Muskingum River, Ohio, locks and dams I, 564, 565; II, 1757, 1759
Mystic River, Mass., dam I, 829
Navigation of, regulations for I, 815
Newton, Ala., dam in Choctawhatchee River I, 830
North Carolina Cut, N. C., waterway via I, 258; II, 1213
Ohio River, Locks and Dams 1, 2, and 6, operating and care I, 553; II, 1727
Ohio River, Locks and Dams 2-7, construction of I, 550; II, 1706
Ohio River, Locks and Dams 8, 11, 13, 18, 19, 26 I, 556; II, 1735
Ohio River, Lock and Dam 37 I, 539; II, 1670
Ohio River, Louisville and Portland Canal I, 570, 575; II, 1795, 1800
Operation and care, appropriation for I, 19
Osage River, Mo., lock and dam I, 514; II, 1601
Ottertail Lake and River, Minn., reservoir dam I, 509; II, 1593
Ouachita River, Ark. and La., locks and dams I, 461; II, 1497
Peconic and Shinnecock Canal, N. Y., bridge I, 828
Permanent appropriation for operation and care I, 19
Plantation Creek, Ga., to Club Creek I, 319; II, 1291
Plaquemine Bayou, La., lock I, 404; II, 1419
Portage Lake canals, Mich., improvement and care I, 597, 599; II, 1853
Port Arthur Canal, Tex I, 423, 424; II, 1443, 1445
Puget Sound-Lake Washington waterway I, 791; III, 2221
Red Lake and Red Lake River, Minn., reservoir dam I, 509; II, 1593
Regulations for navigation of I, 815
Rock Island Rapids, Mississippi River, Iowa, dam I, 830
Rock River, Ill. *See* Illinois and Mississippi Canal, *supra*.
Rough River, Ky., lock and dam I, 582, 583; II, 1820
Rules for navigation of I, 815
St. Clair Flats Canal, Mich., improvement and care I, 693, 694; III, 2041, 2047
St. Joseph River, Mich., dam near Berrien Springs I, 830
St. Louis, Mo., 14-foot waterway from Lockport (Chicago), Ill., to, and thence to mouth of the Mississippi I, 634, 812; III, 1933, 2657
St. Marys Falls Canal, Mich., improvement and care I, 687, 690, 698; III, 2009, 2012
St. Marys Falls canals, Mich. and Ont., commerce I, 690; III, 2016, 2059
St. Michael Canal, Alaska I, 801, 802; III, 2231
Salmon Bay, Wash., waterway via. *See* Puget Sound-Lake Washington waterway, *supra*.
San Joaquin River, Cal., Mormon Channel to Calaveras River I, 744; III, 2146
Sauk Rapids, Mississippi River, Minn., dam I, 830
Scott Point, Tennessee River, lock and dam at Hales bar I, 528; II, 1628
Seattle Canal, Wash. *See* Puget Sound-Lake Washington waterway, *supra*.
Shilshole Bay, Wash., waterway via. *See* Puget Sound-Lake Washington waterway, *supra*.
Shinnecock and Peconic Canal, N. Y., bridge I, 828
South Menominee Canal, Milwaukee, Wis., bridge I, 824
Sturgeon Bay and Lake Michigan Canal, Wis I, 608, 610; III, 1874, 1880
Superior Lake to Keeweenaw Bay I, 597, 599; II, 1853
Susquehanna River, Md., dam near Conowingo I, 830
Teche Bayou, La., lock and dam I, 407; II, 1428
Tennessee River, canals, locks, and dams I, 526, 528, 531; II, 1621, 1626, 1639
Tennessee River, Hales bar, lock and dam I, 528; II, 1628
Tombigbee River, Ala., locks and dams I, 376; II, 1372
Traverse Lake, Minn., reservoir dam I, 509; II, 1593
Trinity River, Tex., locks and dams I, 454; II, 1486
Tug Fork, Big Sandy River, W. Va. and Ky., locks and dams I, 565; II, 1771
Turners Cut, N. C., waterway via I, 258; II, 1212
Union Lake, Wash., waterway via I, 791; III, 2221
Wabash River, Grand Rapids lock and dam I, 576, 578; II, 1805, 1807
Warrior River, Ala., locks and dams I, 373, 374, 382; II, 1370, 1371, 1379
Washington Lake to Puget Sound, waterway I, 791; III, 2221
Washita (Ouachita) River, Ark. and La., locks and dams I, 461; II, 1497
White River, Ark., locks and dams I, 478, 479; II, 1523, 1524
Yamhill River, Oreg., lock and dam I, 768, 770; III, 2188
Yuba River, Cal., restraining dam I, 809; III, 2253, 2262
Canarsie Bay, N. Y., improvement of I, 129; II, 996

Caney Fork River, Tenn.:
Bridge at Buffalo Valley ..... I, 824
Bridge at Ballards Ferry ..... I, 825
Improvement of ..... I, 524; II, 1619
Cape Ann, Mass., construction of harbor of refuge in Sandy Bay ..... I, 47, 903
Cape Charles City Harbor, Va., improvement of ..... I, 257; II, 1211
Cape Fear River, N. C.:
Defenses of ..... I, 5
Improvement above Wilmington ..... I, 282; II, 1244
Improvement at and below Wilmington ..... I, 284; II, 1246
Improvement of Northeast Branch ..... I, 280; II, 1240
Cape May, N. J.:
Examination and survey of Cold Spring Inlet ..... I, 207
Improvement of Cold Spring Inlet ..... I, 195; II, 1117
Cape May Real Estate Company. *See* Cold Spring Inlet.
Cape Neddick River, Me., bridge at York ..... I, 823
Cape Porpoise Harbor, Me., improvement of ..... I, 38, 893
Cape Vincent Harbor, N. Y., improvement of ..... I, 731; III, 2125
Capital City Improvement Company, dam of ..... I, 829
Capitol, Washington, D. C., telegraph line ..... I, 841; III, 2299
Carrabelle Harbor and River, Fla., improvement of ..... I, 348; II, 1335
Carriages, gun and mortar. *See* Fortifications.
Carrs Island, Rock River, Ill., dams at ..... I, 830
Carters Creek, Va., improvement of ..... I, 239; II, 1179
Carthage and Greenville Bridge Company, bridge of ..... I, 825
Carvers Harbor, Me., improvement of ..... I, 30, 886
Cascades Canal, Columbia River, Oreg :
Construction of ..... I, 764; III, 2176
Operating and care ..... I, 766; III, 2177
Casemates, mining. *See* Fortifications.
Cavallo Pass, Tex.:
Examination, etc., of channel to Aransas Pass (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Improvement of channel to Aransas Pass ..... I, 443, 444; II, 1472
Cedar Bayou, Tex., improvement of ..... I, 436, 439; II, 1467
Cedar Creek, Conn. (*see* Bridgeport Harbor) ..... I, 108, 972
Cedar Point, Mobile Bay, Ala., bridge to Dauphin Island ..... I, 818
Central New England Railway Company, bridge of ..... I, 821
Cerritos Slough, Cal., bridges at Long Beach ..... I, 821, 823
Chalmette, La., monument to memory of soldiers who fell in the battle of New Orleans ..... I, 862
Chambersia (Anahuac) channel, Tex., improvement of ..... I, 436, 438; II, 1465
Champlain Lake, N. Y. and Vt.:
Bridge across "The Gut," between North and South Hero islands ..... I, 828
Burlington Harbor, Vt., improvement of ..... I, 72, 924
Narrows, improvement of ..... I, 73, 926
North and South Hero islands channel (The Gut), Vt., improvement of ..... I, 71
Channels. *See* Rivers and harbors.
Charles River, Boston, Mass., improvement of ..... I, 59, 911
Charleston, W. Va.:
See also Kanawha River.
Bridge across Elk River (city bridge) ..... I, 823
Bridge across Kanawha River ..... I, 819
Charleston Harbor, S. C.:
Defenses of ..... I, 5, 9
Improvement of ..... I, 303; II, 1267
Improvement of waterway to McClellanville ..... I, 302; II, 1265
Charlevoix Harbor, Mich., improvement of ..... I, 664; III, 1983
Charlotte Harbor, Fla., improvement of ..... I, 337; II, 1319
Charlotte Harbor, N. Y.:
Improvement of ..... I, 726; III, 2115
Water levels ..... I, 854; III, 2455, 2456
Chartiers Creek, Pa., bridge at McKees Rocks ..... I, 827
Charts:
Military and other ..... I, 858
Minnetonka Lake, Minn ..... I, 510
Northern and Northwestern Lakes ..... I, 842, 848, 852, 853; III, 2443, 2459
Winnebago Lake, Fox River, Wis ..... I, 624

Chattahoochee River, Ga. and Ala., improvement of ..... I, 356; II, 1345
Cheat River, Pa., bridge at Point Marion and Springhill ..... I, 826
Cheboygan Harbor and River, Mich., improvement of harbor ..... I, 667; III, 1989
Checotah (barge), wreck of ..... I, 698; III, 2057
Cheesequake Creek, N. J., improvement of ..... I, 170; II, 1070
Chefuncte River, La., improvement of ..... I, 411; II, 1433
Chehalis County, Wash., bridges of ..... I, 826
Chehalis River, Wash.:
  Bridge at Aberdeen ..... I, 828
  Improvement of ..... I, 783; III, 2212
Chelsea Creek, Mass. (*see* Boston Harbor) ..... I, 60, 912
Chena, Alaska, wreck at ..... I, 802; III, 2232
Chequamegon Bay, Wis. (*see* Ashland Harbor) ..... I, 593; II, 1847
Chesapeake and Delaware Canal, Md. and Del., examination, etc., for ..... I, 228
Chesapeake Bay, Md. and Va.:
  Defenses at entrance ..... I, 5, 11
  Examination and survey for waterway to Beaufort Inlet, N. C ..... I, 263
  Examination, etc., for waterway to Delaware Bay ..... I, 228
  Improvement of waterway to Albemarle Sound, via Currituck Sound ..... I, 258; II, 1213
  Improvement of waterway to sounds of North Carolina (to Pamlico Sound), via Pasquotank River ..... I, 258; II, 1212
  Wreck near Bloody Point light-house, Md ..... I, 228
  York Spit, shoals opposite (*see* Patapsco River) ..... I, 208; II, 1137
Chester, Pa., bridge across Ridley Creek ..... I, 825
Chester River, Md., improvement of ..... I, 219; II, 1149
Chicago and North-Western Railway Company:
  Bridge across Chicago River, Ill ..... I, 822
  Bridge across Mississippi River at Clinton, Iowa ..... I, 819
Chicago Harbor and River, Ill.:
  See also Calumet Harbor and River.
  Application of Sanitary District to reverse flow of Calumet River ..... I, 631
  Bridges (3) across North Branch at Kinzie street (city and railroad bridges) ..... I, 822
  Bridge across North Branch Canal at North Halsted street (city bridge) .. I, 823
  Bridge across South Branch at Stewart avenue ..... I, 826
  Bridges across South Fork of South Branch at Iron street, Center avenue, and West 39th street ..... I, 820
  Bridge across West Arm of South Fork of South Branch at Ashland avenue ..... I, 826
  Bridge across West Fork of South Branch at Central Park avenue ..... I, 825
  Channels in waters connecting Great Lakes, examination and survey .... I, 698
  Channels in waters connecting Great Lakes, improvement of. I, 685; III, 2007, 2059
  Improvement of harbor ..... I, 624; III, 1917
  Improvement of river ..... I, 626; III, 1921
  South Chicago Harbor. *See* Calumet Harbor and River.
  Survey for 14-foot waterway from Lockport to St. Louis, Mo., and thence to the Gulf, including report on water power and land drainage ... I, 634, 812; III, 1933, 2657
  Tunnels under river, alteration of ..... I, 627; III, 1922
  Wrecks near Fullerton avenue and near Rush Street Bridge .... I, 635; III, 1934
Chicago Junction Railway Company, bridges of ..... I, 820
Chicago, Lake Shore and South Bend Railway Company, bridge of ..... I, 818
Chicago, Milwaukee and St. Paul Railway Company:
  Bridge across Burnhams Canal, Milwaukee, Wis ..... I, 823
  Bridge across Chicago River, Ill ..... I, 822
  Bridge across Columbia River, Wash ..... I, 817
  Bridge across Missouri River, S. Dak ..... I, 817
  Bridge across Puyallup River, Wash ..... I, 820
  Bridges across Yellowstone River, Mont ..... I, 817
Chickasahay River, Miss.:
  Bridge at Averas Crossing ..... I, 823
  Bridge at Millers Ferry ..... I, 826
  Improvement of ..... I, 387; II, 1388
Chico Landing, Sacramento River, Cal., bridge at ..... I, 827
Chief of Engineers, officers on duty in Office of the ..... I, 862

Chipola River, Fla.:
Improvement of lower river ..... I, 351; II, 1339
Improvement of upper river ..... I, 352; II, 1340
Chitto, Bogue, La., improvement of ..... I, 410; II, 1432
Chocolate Bayou, Tex., improvement of ..... I, 436, 441; II, 1466
Choctaw Bayou, La.:
Bridge across ..... I, 821
Removal of water hyacinths ..... I, 427; II, 1450
Choctawhatchee Power Company, dam of ..... I, 830
Choctawhatchee River, Fla. and Ala.:
Dam near Newton, Ala ..... I, 830
Improvement of ..... I, 358; II, 1342
Choptank River, Md.:
Improvement of ..... I, 219; II, 1150
Improvement of Cambridge Harbor ..... I, 217; II, 1148
Christiana River, Del., improvement of Wilmington Harbor ..... I, 196; II, 1118
Cincinnati, Ohio:
Construction of Lock and Dam 37, Ohio River ..... I, 539; II, 1670
General improvement of Ohio River ..... I, 536; II, 1653
City of Concord (steamer), wreck of ..... I, 716; III, 2096
City of Richmond (dredge), wreck of ..... I, 249; II, 1199
City of Toledo (schooner), wreck of ..... I, 698; III, 2057
City of Utica (canal boat), wreck of ..... I, 117, 982
Civilian assistants to engineer officers ..... I, 19
Claiborne Harbor, Md., improvement of ..... I, 216; II, 1147
Clark Creek, or River, S. C., improvement of ..... I, 292; II, 1256
Clark Fork, Columbia River, Wash. (*see* Pend Oreille River) ..... I, 799; III, 2228
Clatskanie River, Oreg., improvement of ..... I, 775; III, 2203
Clear Creek, Tex.:
Bridge across ..... I, 825
Improvement of ..... I, 439; II, 1467
Wreck off mouth of ..... I, 450
Cleveland Harbor, Ohio:
Examination and survey for obtaining wharf room for storage ..... I, 717
Improvement of ..... I, 707; III, 2079
Water levels ..... I, 854; III, 2455, 2456
Wreck off ..... I, 716; III, 2096
Clinch River, Va. and Tenn.:
Bridges near milepost 55.3 and near Starnes Bend, Va ..... I, 818
Bridge near St. Paul, Va ..... I, 817
Improvement of ..... I, 533; II, 1647
Clinton, Iowa:
See also Mississippi River.
Bridge across Mississippi River ..... I, 819
Clinton River, Mich.:
Improvement of ..... I, 683; III, 2004
Wreck at mouth ..... I, 685
Club Creek, Ga., improvement of ..... I, 319; II, 1291
Clubfoot and Harlowe Canal, N. C., improvement of waterway via ..... I, 272; II, 1232
Clubfoot Creek, N. C., improvement of waterway via ..... I, 272; II, 1232
Coal Creek Slough, Wash., bridge across ..... I, 827
Coanjock Bay, N. C., improvement of waterway via ..... I, 258; II, 1213
Coast defenses. *See* Fortifications.
Cocheco River, N. H., improvement of ..... I, 41, 896
Coggeshall (barge), wreck of ..... I, 145; II, 1019
Cohansey River, N. J., improvement of ..... I, 193; II, 1115
Coit (Shaws) Cove, New London Harbor, Conn. *See* New London *and* Thames River.
Colbert shoals, Tennessee River, Ala., improvement of ..... I, 528; II, 1630
Cold Spring Inlet, N. J.:
Examination and survey ..... I, 207
Improvement of ..... I, 195; II, 1117
Coldwater River, Miss., improvement of ..... I, 469, 470; II, 1509
College, War, Army, Washington, D. C., erection of buildings for ..... I, 859; III, 2473
Colorado Southern, New Orleans and Pacific Railroad Company:
Bridge across Atchafalaya River, La ..... I, 821
Bridge across Bayou Courtableau, La ..... I, 825

Columbia River, Oreg. and Wash.:
Astoria Harbor, Oreg., examination and survey ..... I, 780
Bridge across Columbia Slough at Vancouver, Wash ..... I, 824
Bridge across Oregon Slough and, at Vancouver, Wash ..... I, 817
Bridge between Douglas and Kittitas counties, Wash ..... I, 817
Cascades Canal, construction of ..... I, 764; III, 2176
Cascades Canal, operating and care ..... I, 766; III, 2177
Celilo, Oreg., to Snake River, improvement from ..... I, 759; III, 2168
Celilo Falls to Snake River, including tributaries, examination and survey ..... I, 768
Celilo Falls to The Dalles Rapids, improvement from ..... I, 762; III, 2171
Clark Fork (*see* Pend Oreille River) ..... I, 799; III, 2228
Gauging ..... I, 779; III, 2208
Mouth of, defenses at ..... I, 5
Mouth of, improvement at ..... I, 773; III, 2196
Mouth of, to Willamette River, improvement from, including dredge construction ..... I, 771; II, 1105; III, 2189
Snake River, above, including tributaries, examination and survey ..... I, 801
Threemile Rapids, improvement at ..... I, 762; III, 2171
Vancouver, Wash., to Willamette River, improvement from ..... I, 767; III, 2182
Wenatchee, Wash., to Bridgeport, examination and survey ..... I, 801
Wenatchee, Wash., to Bridgeport, improvement from ..... I, 798; III, 2226
Wenatchee, Wash., to Kettle Falls, examination of ..... I, 801
Columbia Slough, Columbia River, Oreg., bridge at Vancouver ..... I, 824
Columbus, Christopher, monument to ..... I, 841; III, 2299
Commencement Bay, Wash. *See* Tacoma Harbor.
Commercial statistics, Sault Ste. Marie canals, Mich ..... I, 690; III, 2016, 2059
Commissions (*see also* Boards):
California Débris Commission, with report on future operations ..... I, 809; III, 2253, 2262
Mississippi River Commission ..... I, 812; III, 2605
Permanent International Commission of Congresses of Navigation ..... I, 814
Compton Creek, N. J., improvement of ..... I, 168; II, 1069
Conecuh River, Ala., improvement of ..... I, 363, 364; II, 1354
Coney Island, N. Y. *See* Coney Island channel *and* Coney Island Creek.
Coney Island channel, N. Y.:
Examination and survey, including channel to Rockaway Inlet and Jamaica Bay ..... I, 148
Improvement of ..... I, 144; II, 1018
Coney Island Creek, N. Y., bridges at Coney Island ..... I, 822
Congaree River, S. C.:
Construction of lock and dam near Granby ..... I, 301; II, 1264
Improvement by open-channel work ..... I, 299; II, 1263
Operating and care of lock and dam ..... I, 302; II, 1265
Congress, 59th, 2d session, laws of, affecting Corps of Engineers ..... III, 2477
Congresses of Navigation, Permanent International Commission of ..... I, 814
Conneaut Harbor, Ohio:
Improvement of ..... I, 714; III, 2092
Wreck off ..... I, 716; III, 2096
Connecticut River, Mass. and Conn.:
Improvement below Hartford, Conn ..... I, 99, 960
Survey between Hartford, Conn., and Holyoke, Mass ..... I, 97, 118, 959
Connors Point, Duluth Harbor, Minn., bridge across St. Louis Bay ..... I, 826
Conowingo, Md., dam in Susquehanna River near ..... I, 830
Contentnia Creek, N. C.:
Bridge at Hookerton ..... I, 827
Improvement of ..... I, 267; II, 1226
Continuing contracts ..... I, 20
Ahnapee (Algoma) Harbor, Wis ..... I, 610; III, 1881
Algoma Harbor, Wis ..... I, 610; III, 1881
Allegheny River, Pa., locks and dams ..... I, 548; II, 1699
Ambrose channel, New York Harbor, N. Y ..... I, 148; II, 1025, 1106
Ann, Cape, Mass., Sandy Bay, harbor of refuge ..... I, 47, 903
Appomattox River, Va ..... I, 256; II, 1208
Aransas Pass, Tex ..... I, 447; II, 1475
Aransas Pass, Tex., to Corpus Christi, channel from ..... I, 443, 445; II, 1472, 1473

Continuing contracts—Continued.
Arthur Kill, N. Y. and N. J ..... I, 157; II, 1048
Ashtabula Harbor, Ohio ..... I, 712; III, 2088
Back Cove, Portland, Me ..... I, 35, 890
Baltimore Harbor, Md., Patapsco River and channel to ..... I, 208; II, 1137
Bay Ridge channel, New York Harbor, N. Y ..... I, 151; II, 1034
Beaufort Inlet, N. C., to Pamlico Sound, waterway ..... I, 271; II, 1231
Bee Tree shoals, Tennessee River, Ala ..... I, 528; II, 1630
Big Sandy River, W. Va. and Ky ..... I, 565; II, 1771
Biscayne Bay, Fla ..... I, 332; II, 1313
Black Lake Harbor, Holland, Mich ..... I, 647; III, 1956
Black River (Lorain) Harbor, Ohio ..... I, 706; III, 2074
Black Rock Harbor, Buffalo, N. Y ..... I, 724; III, 2110
Black Rock Harbor, Buffalo, N. Y., Lake Erie entrance ..... I, 722; III, 2108
Black Warrior River, Ala., above Tuscaloosa ..... I, 373; II, 1370
Black Warrior River, Ala., below Tuscaloosa ..... I, 374; II, 1371
Boston Harbor, Mass ..... I, 56, 910
Brazos River, Tex., at mouth ..... I, 446; II, 1474
Brazos River, Tex., Old Washington to Waco ..... I, 452; II, 1483
Brazos River, Tex., to Galveston, waterway ..... I, 443; II, 1471
Bridgeport Harbor, Conn ..... I, 108, 972
Brunswick Harbor, Ga ..... I, 319; II, 1292
Buffalo Bayou, Tex ..... I, 434; II, 1461
Buffalo Harbor, N. Y ..... I, 720; III, 2103
Buffalo Harbor, N. Y., Black Rock Harbor ..... I, 724; III, 2110
Buffalo Harbor, N. Y., Lake Erie entrance to Erie Basin and Black Rock Harbor ..... I, 722; III, 2108
Burlington Harbor, Vt ..... I, 72, 924
Calumet River, Ill. and Ind ..... I, 629; III, 1926
Cape Ann, Mass., Sandy Bay harbor of refuge ..... I, 47, 903
Cape Fear River, N. C., at and below Wilmington ..... I, 284; II, 1246
Cavallo Pass, Tex., to Aransas Pass, channel from ..... I, 443, 444; II, 1472
Champlain Lake, Burlington Harbor, Vt ..... I, 72, 924
Charleston Harbor, S. C ..... I, 303; II, 1267
Chicago Harbor, Ill., Calumet River ..... I, 629; III, 1926
Cleveland Harbor, Ohio ..... I, 707; III, 2079
Colbert shoals, Tennessee River, Ala ..... I, 528; II, 1630
Cold Spring Inlet, N. J ..... I, 195; II, 1117
Columbia River, Oreg. and Wash., at the mouth ..... I, 773; III, 2196
Columbia River, below mouth of Willamette River ..... I, 771; II, 1105; III, 2189
Columbia River, The Dalles Rapids to Celilo Falls ..... I, 762; III, 2171
Congaree River, S. C., between Columbia and Granby ..... I, 301; II, 1264
Conneaut Harbor, Ohio ..... I, 714; III, 2092
Corpus Christi, Tex., to Aransas Pass, channel from ..... I, 443, 445; II, 1472, 1473
Cumberland River above Nashville, Tenn. (Locks 3-7 and 21) ..... I, 521; II, 1613
Delaware River, N. J., Pa., and Del ..... I, 176; II, 1079, 1105
Detroit River, Mich ..... I, 695; III, 2049
Duluth Harbor, Minn ..... I, 586; II, 1827
East (Ambrose) channel, New York Harbor, N. Y ..... I, 148; II, 1025, 1106
Erie Basin, Buffalo, N. Y., Lake Erie entrance ..... I, 722; III, 2108
Fairhaven Harbor, Mass ..... I, 79, 937
Franklin, La., to Mermentau, waterway ..... I, 415; II, 1437
Galveston and Brazos Canal, Tex ..... I, 443; II, 1471
Galveston Harbor, Tex ..... I, 429; II, 1453
Galveston Harbor, Tex., inner bar to Fifty-sixth street ..... I, 431; II, 1456
Galveston Harbor, Tex., to Brazos River, waterway ..... I, 443; II, 1471
Galveston-Houston waterway, Tex ..... I, 434; II, 1461
Gloucester Harbor, Mass ..... I, 49, 903
Gowanus Bay channels, New York Harbor, N. Y ..... I, 151; II, 1034
Grays Harbor, Wash ..... I, 781; III, 2211
Great Lakes, channels in connecting waters of ..... I, 685; III, 2007
Great Pedee River, S. C ..... I, 293; II, 1256
Guadalupe River, Tex ..... I, 443, 444; II, 1473
Gulfport, Miss., channel to Ship Island Harbor ..... I, 390; II, 1392
Hales bar lock, Tennessee River ..... I, 528; II, 1628
Harbor Beach, Mich ..... I, 674; III, 1994
Hay Lake channel, St. Marys River, Mich ..... I, 691; III, 2036
Hillsboro Bay, Fla ..... I, 341; II, 1326

Continuing contracts—Continued.
Hilo Harbor, Hawaii ..... I, 805; III, 2236
Holland Harbor, Mich ..... I, 647; III, 1956
Honolulu Harbor, Hawaii ..... I, 803; III, 2233
Houston-Galveston waterway, Tex ..... I, 434; II, 1461
Huron Harbor, Ohio ..... I, 703; III, 2070
Illinois and Mississippi Canal, Ill ..... I, 637; III, 1940
Judith, Point, R. I., harbor of refuge ..... I, 89, 947
Kalamazoo River, Mich ..... I, 645; III, 1952
Kennebec River, Me ..... I, 32, 888
Kentucky River, Ky ..... I, 568; II, 1781
Levisa Fork, Big Sandy River, Ky ..... I, 565; II, 1771
Lorain Harbor, Ohio ..... I, 706; III, 2074
Ludington Harbor, Mich ..... I, 657; III, 1974
Lynn Harbor, Mass ..... I, 52, 906
Manitowoc Harbor, Wis ..... I, 613; III, 1886
Marquette Harbor, Mich ..... I, 599; II, 1862
Maumee Bay and River, Ohio, Toledo Harbor ..... I, 699; III, 2061
Mermentau, La., to Franklin, waterway ..... I, 415; II, 1437
Michigan Lake-Sturgeon Bay Canal, including harbor of refuge ..... I, 608; III, 1874
Milwaukee (inner) Harbor, Wis ..... I, 618; III, 1897
Milwaukee Harbor, Wis., including harbor of refuge ..... I, 616; III, 1893
Mississippi River, Head of Passes to Ohio River ..... I, 812; III, 2605
Mississippi River, between Missouri and Ohio rivers ..... I, 487 II, 1539
Mississippi River, between Missouri River and Minneapolis ..... I, 491 II, 1559
Mississippi River at Moline, Ill ..... I, 495 II, 1570
Mississippi River, between St. Paul and Minneapolis ..... I, 497 II, 1578
Mississippi River, South Pass ..... I, 400; II, 1413
Mississippi River, Southwest Pass ..... I, 396; II, 1400
Mobile Harbor, Ala ..... I, 369 II, 1365
Moline Harbor, Ill ..... I, 495; II, 1570
Monongahela River, W. Va. and Pa ..... I, 542, 543; II, 1679, 1681
Mormon Channel, San Joaquin River, Cal ..... I, 744; III, 2146
Narragansett Bay, R. I ..... I, 84, 942
Neches River, Tex., at mouth ..... I, 421; II, 1443
Neebish channels, St. Marys River, Mich ..... I, 691; III, 2036
Newark Bay, N. J ..... I, 154; II, 1042
New Bedford Harbor, Mass ..... I, 79, 937
New Haven Harbor, Conn., breakwater construction ..... I, 103, 966
New Haven Harbor, Conn., dredging, etc ..... I, 102, 964
New London Harbor, Conn ..... I, 96, 956
Newport Harbor, R. I ..... I, 87, 945
Newtown Creek, N. Y ..... I, 134; II, 1002
New York Harbor, N. Y., Ambrose channel ..... I, 148; II, 1025, 1106
New York Harbor, N. Y., Gowanus Bay channels ..... I, 151; II, 1034
Norfolk Harbor, Va ..... I, 250; II, 1201
Northern and Northwestern Lakes, channels connecting ..... I, 685; III, 2007
Oakland Harbor, Cal ..... I, 740; III, 2141
Ocmulgee River, Ga ..... I, 317; II, 1289
Ohio River, Dams Nos. 2–6 ..... I, 550; II, 1706
Ohio River, Dams Nos. 8, 11, 13, 18, and 26 ..... I, 556; II, 1735
Ohio River, Dam No. 37 ..... I, 539; II, 1670
Osage River, Mo ..... I, 514; II, 1601
Oswego Harbor, N. Y ..... I, 729; III, 2123
Ouachita River, Ark. and La ..... I, 461; II, 1497
Pamlico Sound, N. C., to Beaufort Inlet, waterway ..... I, 271; II, 1231
Passaic River, N. J ..... I, 154; II, 1042
Pass Cavallo, Tex., to Aransas Pass, channel from ..... I, 443, 444; II, 1472
Patapsco River, Md., and channel to Baltimore ..... I, 208; II, 1137
Pedee River, S. C ..... I, 293; II, 1256
Philadelphia, Pa., Delaware River ..... I, 176; II, 1079, 1105
Plaquemine Bayou, La ..... I, 404; II, 1419
Point Judith, R. I., harbor of refuge ..... I, 89, 947
Portland Harbor, Me ..... I, 35, 890
Providence Harbor and River, R. I ..... I, 84, 942
Rappahannock River, Va ..... I, 241; II, 1182
Red Hook channel, New York Harbor, N. Y ..... I, 151; II, 1034
Sabine Lake and River, Tex ..... I, 421; II, 1443

Continuing contracts—Continued.
Sabine Pass, Tex ..... I, 425; II, 1447
St. Johns River, Fla., Jacksonville to the ocean ..... I, 328; II, 1305
St. Marys River, Mich., at the falls ..... I, 687; III, 2009
St. Marys River, Mich., Hay Lake and Neebish channels ..... I, 691; III, 2036
St. Michael Canal, Alaska ..... I, 801; III, 2231
Sandbeach (Harbor Beach) harbor of refuge, Mich ..... I, 674; III, 1994
Sandusky Harbor, Ohio ..... I, 701; III, 2067
Sandy Bay, Cape Ann, Mass., harbor of refuge ..... I, 47, 903
San Joaquin River, Cal., Stockton and Mormon channels ..... I, 744; III, 2146
San Juan Harbor, P. R ..... I, 806; III, 2239
San Luis Obispo Harbor, Cal ..... I, 738; III, 2138
San Pablo Bay, Cal ..... I, 742; III, 2143
San Pedro, Cal., Wilmington inner harbor ..... I, 736; III, 2135
San Pedro Bay, Cal., Wilmington outer harbor ..... I, 735; III, 2133
Saugatuck Harbor, Mich ..... I, 645; III, 1952
Savannah Harbor, Ga ..... I, 305; II, 1106, 1271
Scott Point, Tennessee River, Ala., lock at Hales bar, near ..... I, 528; II, 1628
Ship Island Harbor, Miss., channel to Gulfport ..... I, 390; II, 1392
South Pass, Mississippi River ..... I, 400; II, 1413
Southwest Pass, Mississippi River ..... I, 396; II, 1400
Staten Island Sound, N. Y. and N. J ..... I, 157; II, 1048
Stockton Channel, San Joaquin River, Cal ..... I, 744; III, 2146
Sturgeon Bay Canal, Wis., including harbor of refuge ..... I, 608; III, 1874
Superior Harbor, Wis ..... I, 586; II, 1827
Tacoma Harbor, Wash ..... I, 789; III, 2219
Tampa Bay, Fla ..... I, 340; II, 1324
Tampa Harbor, Fla., Hillsboro Bay ..... I, 341; II, 1326
Tennessee River, Ala., Colbert and Bee Tree shoals ..... I, 528; II, 1630
Tennessee River, Ala., Hales bar lock, near Scott Point ..... I, 528; II, 1628
Toledo Harbor, Ohio ..... I, 699; III, 2061
Tombigbee River, Ala., between mouth and Demopolis ..... I, 376; II, 1372
Trinity River, Tex., locks and dams ..... I, 454; II, 1486
Tug Fork, Big Sandy River, W. Va. and Ky ..... I, 565; II, 1771
Turtle Cove channel, Tex ..... I, 443, 445; II, 1472, 1473
Warrior River, Ala., above Tuscaloosa ..... I, 373; II, 1370
Warrior River, Ala., below Tuscaloosa ..... I, 374; II, 1371
Washita (Ouachita) River, Ark. and La ..... I, 461; II, 1497
West Galveston Bay, Tex ..... I, 443; II, 1471
Willamette River, below Portland, Oreg ..... I, 771; II, 1105; III, 2189
Wilmington, Cal., inner harbor ..... I, 736; III, 2135
Wilmington, Cal., outer harbor ..... I, 735; III, 2133
Wilmington, N. C., Cape Fear River at and below ..... I, 284; II, 1246
Winyah Bay, S. C ..... I, 294; II, 1258
Withlacoochee River, Fla ..... I, 345; II, 1331
Woods Hole channel, Mass ..... I, 78, 935
Contracts, continuing. *See* Continuing contracts.
Cooper, Adelaide (bark), wreck of ..... III, 2136
Cooper Creek, N. J., improvement of ..... I, 186; II, 1108
Coosa River, Ga. and Ala.:
Improvement above East Tenn., Va. and Ga. R. R. bridge ..... I, 366, 367; II, 1359
Improvement below East Tenn., Va. and Ga. R. R. bridge ..... I, 366, 368; II, 1361
Operating and care of locks and dams ..... I, 369; II, 1363
Coosawattee River, Ga., improvement of ..... I, 366, 368; II, 1362
Coos Bay, Harbor, and River, Oreg.:
Construction of dredge for Oregon coast harbors ..... I, 758; III, 2168
Improvement of entrance to bay and harbor ..... I, 752; III, 2160
Improvement of river ..... I, 754; III, 2162
Coquille River, Oreg., improvement of, including dredge construction ..... I, 751, 758; III, 2157, 2168
Corney Bayou, La., improvement of ..... I, 463, 466; II, 1504
Core Creek, N. C., waterway via. *See* Beaufort Inlet.
Corps of Engineers:
Civilian assistants to engineer officers ..... I, 19
Duties ..... I, 3, 4
Engineer depots ..... I, 15, 867, 873, 875
Engineer equipment of troops ..... I, 18, 869, 873, 875

Corps of Engineers—Continued.
Engineer School of Application, buildings for ..... I, 859, 860; III, 2473
Laws of 59th Congress, 2d session, affecting the ..... III, 2477
Officers on duty in Office of the Chief of Engineers ..... I, 862
Personnel ..... I, 3
Corpus Christi Bay and Harbor, Tex.:
Examination, etc., for waterways from the Rio Grande to Mississippi River via ..... I, 451
Improvement of channel from Corpus Christi to Aransas Pass via Turtle Cove ..... I, 443, 445; II, 1472, 1473
Survey for channel from Corpus Christi to Aransas Pass via Turtle Cove. I, 451
Cottonplant, Ark., bridge across Cache River ..... I, 827
Course Landing, Salem Creek, N. J., bridge at ..... I, 829
Courtableau Bayou, La., bridge in St. Landry Parish ..... I, 825
Cowlitz River, Wash.:
Bridge near Olequa ..... I, 827
Improvement of ..... I, 776; III, 2204
Cox Ferry, D'Arbonne Bayou, La., bridge at ..... I, 821
Cradock Bridge, Medford, Mass., dam across Mystic River near ..... I, 829
Craft, water. *See* Dredge boats *and* Wrecks.
Craven County, N. C., bridge of ..... I, 822
Crisfield Harbor, Md., improvement of ..... I, 227 II, 1161
Croatan Sound, N. C., improvement of waterway via ..... I, 258; II, 1212
Crockett, Fort, Galveston, Tex., sea wall, embankment, and fill.. I, 10, 450; II, 1476
Crooked (Carrabelle) River, Fla. (*see* Carrabelle Harbor) ..... I, 348; II, 1335
Crosthwaite, Wm. (schooner), wreck of ..... I, 716; III, 2096
Crystal River, Fla., improvement of ..... I, 342; II, 1328, 1329
Cuba, defenses of Guantanamo Bay ..... I, 11, 12, 15
Cuero, Tex., examination and survey for channel to Aransas Pass ..... I, 451
Culebra Island, P. R., examination of Great Harbor ..... I, 807
Cumberland River, Ky. and Tenn.:
Bridges at Nashville, Tenn ..... I, 819
Gauging (*see* Mississippi River Commission) ..... I, 812; III, 2610, 2648
Improvement above Nashville, Tenn ..... I, 521; II, 1613
Improvement below Nashville, Tenn ..... I, 519; II, 1610
Improvement of, and tributaries, including South Fork, by Cumberland River Improvement Company ..... I, 522; II, 1613
Operating and care of locks and dams ..... I, 524; II, 1618
Wrecks at Nashville, Tenn ..... I, 525; II, 1620
Cumberland River Improvement Company. *See* Cumberland River.
Cumberland Sound, Ga. and Fla.:
Improvement of ..... I, 324; II, 1298
Improvement of waterway between Savannah and Fernandina... I, 322; II, 1295
Current River, Ark. and Mo., improvement of ..... I, 482; II, 1529
Currituck Sound, N. C., improvement of waterway via ..... I, 258; II, 1213
Curtis Bay, Baltimore, Md., improvement of channel to ..... I, 210; II, 1141
Cuyahoga River, Ohio. *See* Cleveland Harbor.
Cypress Bayou, Tex. and La., improvement of ..... I, 455; II, 1489
Cypress Top Outlet, Choctawhatchee River, Fla., improvement of... I, 358; II, 1348

D.

Dalecarlia reservoir, Washington Aqueduct, D. C ..... I, 836; III, 2283
Dams. *See* Canals, Rivers and Harbors, *and* Waterways.
D'Arbonne Bayou, La.:
Bridge at Cox Ferry ..... I, 821
Improvement of ..... I, 463, 466; II, 1504
Darby Creek, Pa., bridge at Media ..... I, 825
Darien Harbor, Ga., improvement of ..... I, 311; II, 1283
Dauphin Island, Mobile Bay, Ala., bridge to Cedar Point ..... I, 818
Davenport Water Power Company, water-power canal, etc., of ..... I, 830
Davidson County, Tenn., bridges of ..... I, 819
Davis Island dam, Ohio River, Pa., operating and care ..... I, 553; II, 1727
Davis, Samuel S., dam of ..... I, 830
Débris, mining, in California ..... I, 809; III, 2253
Deckers Cove, Me., bridge at Southport ..... I, 827

Deep Creek Branch, Elizabeth River, Va., improvement of waterway via..... I, 258; II, 1212
Deer Park, Ill., bridge of town of..... I, 825
Defenses, seacoast. *See* Fortifications.
Delancey Cove, N. Y. (*see* Larchmont Harbor)..... I, 120; II, 986
Delaware and Chesapeake Canal, Del. and Md., examination of..... I, 228
Delaware Bay and River, N. J., Pa., and Del.:
Chesapeake and Delaware Canal, examination, etc., for..... I, 228
Defenses of..... I, 5
Delaware Breakwater, Del., maintenance and repair of..... I, 183; II, 1102
Harbor of refuge in bay, construction of..... I, 184; II, 1103
Improvement of river, including dredge construction..... I, 176; II, 1079, 1105
Lewes, Del., iron pier, maintenance and repair of..... I, 183; II, 1102
Marcushook, Pa., improvement of ice harbor..... I, 182; II, 1101
Perriwig bar, improvement of..... I, 181; II, 1100
Philadelphia and Camden harbors, improvement of..... I, 176, 181; II, 1079, 1100
Wrecks in..... I, 185; II, 1103, 1104
Delaware County, Pa., bridge of..... I, 825
Delta Southern Railway Company, bridges of..... I, 817, 822
Denaud, Fla., bridge across Caloosahatchee River..... I, 827
Dennis, Mass., bridge across Bass River..... I, 827
Departments, Executive, Washington, D. C., telegraph line..... I, 841; III, 2299
Depots, engineer..... I, 15, 867, 873, 875
Derelicts. *See* Wrecks.
Deschutes River, Wash. *See* Olympia Harbor.
Des Moines Rapids Canal and dry dock, Mississippi River, operating and care I, 494; II, 1568
Des Ourse Bayou, La., bridge across..... I, 821
Des Plaines River, Ill., survey for 14-foot waterway via, including report on water power and land drainage..... I, 634, 812; III, 1933, 2657
Detroit River, Mich.:
Discharge of..... I, 853; III, 2457
Examination and survey of channels in waters connecting Great Lakes.. I, 698
Improvement of..... I, 695; III, 2049, 2059
Improvement of channels in waters connecting Great Lakes I, 685; III, 2007, 2059
Surveys, etc. (*see* Northern and Northwestern Lakes)..... I, 842; III, 2443, 2459
Wreck above Belle Isle bridge..... I, 698; III, 2057
Dickinson Bayou, Tex.:
Bridge across..... I, 825
Improvement of..... I, 440; II, 1468
Disappearing gun carriages. *See* Fortifications.
Discharge measurements. *See* Gauging.
Dismal Swamp Canal, Va. and N. C., improvement of waterway via.. I, 258; II, 1212
District of Columbia. *See* Washington.
Dividing Creek (La Trappe River), Md., improvement of..... I, 222; II, 1154
Division engineers..... I, 20
Divisions, engineer..... I, 20
Doboy bar, Ga., improvement of..... I, 312; II, 1283
Dock lines, establishment of..... I, 814
Dog Island Harbor, St. George Sound, Fla. *See* Carrabelle Harbor.
Dog River, Miss. (*see* Pascagoula River)..... I, 383; II, 1385
Doherty, Mamie (canal boat), wreck of..... I, 147; II, 1022
Dolphins, building of..... I, 829
Dominion of Canada:
Commerce through St. Marys Falls Canal, Ont..... I, 690; III, 2016
Transmission of electrical power into United States at Niagara Falls. I, 854, 855; III, 2457
Donaldsonville, La., examination and survey for waterway to the Rio Grande, Tex..... I, 451
Doodletown Bight, or Creek, N. Y., bridge across..... I, 824
Doon, Bonnie (barkentine), wreck of..... I, 94, 953
Dorchester Bay, Mass.:
Examination and survey..... I, 74
Improvement of..... I, 62, 918
Dormas Broussard Crossing, Bayou Vermilion, La., bridge at..... I, 826
Double Bayou, Tex., improvement of..... I, 437; II, 1465
Douglass, Hattie (schooner), wreck of..... I, 154; II, 1040
Dover Point, N. H., bridge across Piscataqua River..... I, 827

Drawbridges:
See also Bridges.
Rules for opening of ..... I, 815
Drawings. *See* Maps.
Dredge boats:
Columbia River, Oreg. and Wash., mouth to Willamette River ..... I, 771; II, 1105; III, 2189
Delaware River ..... I, 176; II, 1079, 1105
Galveston Bay and Harbor, Tex ..... II, 1477
Mississippi coast harbors ..... I, 394
New York Harbor, N. Y ..... I, 148; II, 1025, 1106
Oregon coast harbors ..... I, 758; III, 2168
Pensacola Harbor, Fla ..... I, 361; II, 1104, 1352
Savannah Harbor, Ga ..... I, 305; II, 1106, 1271
Washington State coast harbors ..... I, 758; III, 2168
Willamette River, Oreg., below Portland ..... I, 771; II, 1105; III, 2189
Duck Creek (Smyrna River), Del., improvement of ..... I, 205; II, 1131
Duck Island Harbor, Conn., construction of harbor of refuge ..... I, 100, 962
Duck River, Conn., bridge at Lyme ..... I, 823
Duluth Canal and Harbor, Minn.:
Bridge across St. Louis Bay between Rices and Connors points ..... I, 826
Bridge across St. Louis Bay to Superior, Wis ..... I, 824
Channels in waters connecting Great Lakes, examination and survey ..... I, 698
Channels in waters connecting Great Lakes, improvement of ..... I, 685; III, 2007, 2059
Examination and survey of harbor ..... I, 603
Improvement of ..... I, 586; II, 1827
Dumbarton (or Potrero) Point, San Francisco Bay, Cal.:
Bridge across Newark Slough, near ..... I, 821
Bridge across San Francisco Bay, at ..... I, 823
Dunkirk Harbor, N. Y., improvement of ..... I, 719; III, 2101
Dutch Island Harbor, R. I. (*see* Narragansett Bay) ..... I, 84, 942
Duval County, Fla., bridge of ..... I, 828
Duwamish River, Wash., improvement of (*see* Puget Sound) ..... I, 785; III, 2214
Duxbury Harbor, Mass., improvement of ..... I, 68, 922

E.

Eagle Harbor, Wash., harbor lines ..... I, 815
Eaglet (schooner), wreck of ..... I, 145; II, 1019
East Bay Bayou, Tex., improvement of ..... I, 436, 437; II, 1465
East Carolina Railway, bridge of ..... I, 827
East (Ambrose) channel, New York Harbor, N. Y., improvement of, including dredge construction ..... I, 148; II, 1025, 1106
East Chester Creek, N. Y., improvement of ..... I, 123; II, 989
East Chicago, Ind., bridge across Calumet River ..... I, 818
Eastern Bay, Md. (*see* Claiborne Harbor) ..... I, 216; II, 1147
Eastern Branch, Elizabeth River, Va., improvement of Norfolk Harbor. I, 250; II, 1201
Eastern Branch of the Potomac (Anacostia River), D. C., improvement of ..... I, 232; II, 1168
East Lyme, Conn., bridge across Niantic River ..... I, 823
East Norwalk Harbor, Conn.:
Examination and survey ..... I, 118
Improvement of (*see* Norwalk Harbor) ..... I, 111, 975
East Pass, Carrabelle Harbor, Fla., improvement of ..... I, 348; II, 1335
East Passaic, N. J.:
See also Passaic River.
Bridge across Passaic River ..... I, 820
East Pearl River, Miss. (*see* Pearl River below Rockport) ..... I, 392; II, 1395
East River, Ga. *See* Brunswick Harbor.
East River, N. Y.:
Harbor lines at New York City ..... I, 814
Improvement of ..... I, 131; II, 999
Wrecks in ..... I, 145, 146, 147; II, 1019, 1020, 1023
East Twin River, Wis.:
See also Two Rivers Harbor.
Harbor lines at Two Rivers Harbor ..... I, 815
East waterway, Seattle, Wash., bridge across ..... I, 822

Ebey Slough, Wash., improvement of (*see* Puget Sound) ..... I, 785; III, 2214
Echo Bay Harbor, N. Y.:
Examination of Long rock ..... I, 148
Improvement of, including removal of Long rock ..... I, 121; II, 987
Edenton Bay and Harbor, N. C., harbor lines at Edenton ..... I, 815
Eel River, Mass. (*see* Plymouth Harbor) ..... I, 69, 922
Elizabeth, Pa., harbor lines in Monongahela River ..... I, 815
Elizabeth River, N. J., improvement of ..... I, 168; II, 1067
Elizabeth River, Va.:
Improvement of Norfolk Harbor and its approaches, including Hospital Point ..... I, 250; II, 1201
Improvement of waterway to Albemarle Sound via Currituck Sound I, 258; II, 1213
Improvement of waterway to sounds of North Carolina via Pasquotank River ..... I, 258; II, 1212
Improvement of Western Branch ..... I, 252; II, 1204
Wreck in Norfolk Harbor ..... I, 262; II, 1219
Elizabeth River Railroad Company, bridge of ..... I, 820
Elk Point, S. Dak. (*see* Missouri River) ..... I, 511; II, 1595
Elk River, Md., improvement of ..... I, 212; II, 1143
Elk River, W. Va.:
Bridge at Charleston ..... I, 823
Bridge at Frametown ..... I, 820
Bridge near Yankeedam ..... I, 824
Elk River Shoals Canal, Tennessee River, Ala ..... I, 528, 531; II, 1639
Elliott Bay, Wash., bridge across East and West waterways at Seattle and West Seattle ..... I, 822
Elliott Slough, Wash., bridge at Aberdeen ..... I, 822
Ellis Slough, Wash., bridge near Raymond ..... I, 826
Embankments. *See* Fortifications.
Embury (steamer), wreck of (*see* Niagara River) ..... I, 725; III, 2112
Emplacements. *See* Fortifications.
Employees, civilian assistants to engineer officers ..... I, 19
Endicott Board ..... I, 5
Engineer depots ..... I, 15, 867, 873, 875
Engineer divisions ..... I, 20
Engineer equipment of troops ..... I, 18, 869, 873, 875
Engineer officers, civilian assistants to ..... I, 19
Engineer School of Application, buildings for ..... I, 859, 860; III, 2473
Engineers, Boards, etc., of. *See* Boards *and* Commissions.
Engineers, Corps of. *See* Corps of Engineers.
Engineers, division ..... I, 20
Engineers, Office of the Chief of, officers on duty ..... I, 862
Engineers, The Board of ..... I, 5, 865
Ensley Southern Railway Company, bridge of ..... I, 824
Equipment, engineer, of troops ..... I, 18, 869, 873, 875
Erie Basin, Buffalo, N. Y.:
Improvement of Buffalo entrance ..... I, 723; III, 2110
Improvement of Lake Erie entrance ..... I, 722; III, 2108
Erie Harbor, Pa., improvement of ..... I, 717; III, 2097
Erie Lake (*see also* Northern and Northwestern Lakes):
Water levels and discharges ..... I, 853, 854; III, 2455, 2456, 2457
Wrecks in ..... I, 716; III, 2096
Erie Railroad Company, bridge of ..... I, 827
Escambia River, Fla., improvement of ..... I, 363; II, 1354
Esopus Creek, N. Y. (*see* Saugerties Harbor) ..... I, 139; II, 1012
Essex County, N. J., bridge of ..... I, 820
Essex River, Mass., improvement of ..... I, 46, 902
Estherville-Minim Creek Canal, S. C., improvement of ..... I, 297; II, 1260
Estimates of appropriations required:
Fortifications ..... I, 15
Rivers and harbors, etc ..... I, 20
Eureka, Cal., improvement at (*see* Humboldt Harbor) ..... I, 748; III, 2149
Evansville, Mount Carmel and Northern Railway, bridge of ..... I, 818
Everett Harbor, Wash.:
Bridge of city across Snohomish River ..... I, 821
Improvement of ..... I, 794; III, 2223
Examinations of rivers and harbors, under act of March 2, 1907 ..... I, 21
Exchange (schooner), wreck of ..... I, 624; III, 1916

Executive Departments, Washington, D. C., telegraph line ..... I, 841; III, 2299
Executive Mansion and office, Washington, D. C ..... I, 841; III, 2299
Exeter River, N. H., improvement of ..... I, 42, 897
Expenditures:
Fortifications ..... I, 12
Rivers and harbors ..... I, 19

F.

Fairhaven Harbor, Mass.:
Examination and survey ..... I, 94
Improvement of ..... I, 79, 937
Fairport Harbor, Ohio:
Improvement of ..... I, 711; III, 2086
Wreck in ..... I, 716; III, 2096
Fairy (Caddo) Lake, Tex. and La. *See* Cypress Bayou.
Falia, Bogue, La., improvement of ..... I, 411; II, 1433
Fall River Harbor, Mass., improvement of ..... I, 86, 944
Falls of Ohio River, Louisville, Ky.:
Improvement of ..... I, 570; II, 1795
Operating and care of Louisville and Portland Canal ..... I, 575; II, 1800
Fayette County, Pa., bridge of ..... I, 826
Feather River, Cal.:
Improvement of ..... I, 749; III, 2153
Improvement of, by California Débris Commission, with report on future operations ..... I, 809; III, 2253, 2262
Fernandina Harbor, Fla.:
Improvement of ..... I, 326; II, 1301
Improvement of Cumberland Sound ..... I, 324; II, 1298
Improvement of waterway to Savannah, Ga ..... I, 322; II, 1295
Ferry (Caddo) Lake, Tex. and La. *See* Cypress Bayou.
Filtration plant, Washington Aqueduct, D. C ..... I, 838, 839; III, 2289, 2291
Finders, range and position. *See* Fortifications.
Fire control at fortifications. *See* Fortifications.
Fishers Island, N. Y., examination and survey of Hay (West) Harbor ..... I, 118
Fishing Creek, N. C., improvement of ..... I, 264; II, 1223
Fish traps, or weirs:
In Puget Sound, Wash., inspection, etc., of ..... I, 787; III, 2217
Permits for construction of ..... I, 829
Fivemile River Harbor, Conn., improvement of ..... I, 112, 976
Flag River, Wis. (*see* Port Wing Harbor) ..... I, 592; II, 1845
Flat Lake, La. (*see* Grand River) ..... I, 404; II, 1419
Flint River, Ga., improvement of ..... I, 354; II, 1342
Florence, Ala.:
See also Tennessee River.
Wreck in Tennessee River ..... I, 536; II, 1652
Florida, removal of water hyacinths from waters in ..... I, 346; II, 1333
Florida East Coast Railway Co., basin at Miami, Fla., construction of. I, 332; II, 1313
Flushing Bay, N. Y., improvement of ..... I, 128; II, 995
Folmina (White Cliffs), Ark., bridge across Little River ..... I, 827
Fond du Lac Harbor, Wis. (*see* Fox River) ..... I, 622; III, 1907
Foreign possessions. *See* Alaska *and* Insular possessions.
Fore River, Portland, Me. *See* Portland Harbor.
Fore (Weymouth) River, Mass., improvement of ..... I, 63, 64, 918
Forked Deer River, Tenn., improvement of ..... I, 517; II, 1609
Fort Crockett, Galveston, Tex., sea wall, embankment, and fill... I, 10, 450; II, 1476
Fortesque Beach, N. J., wreck off ..... I, 185; II, 1104
Fortifications:
Appropriations, condition of ..... I, 12
Batteries ..... I, 5, 6, 7
Batteries in insular possessions ..... I, 11
Board of Engineers, The ..... I, 5, 865
Board on Fortifications or other Defenses (Endicott Board) ..... I, 5
Electrical installations ..... I, 8
Electrical installations, insular possessions ..... I, 11
Emplacements, modernizing the older ..... I, 7
Estimates of appropriations required ..... I, 15
Fire control ..... I, 8

Fortifications—Continued.
Fire control at batteries in insular possessions ..... I, 12
General statement and progress of work ..... I, 5, 6
National Coast Defense Board ..... I, 5
Preservation and repair of ..... I, 9
Preservation and repair of torpedo structures ..... I, 11
Projects ..... I, 5
Repairs and protection at defenses of Charleston, Pensacola, Mobile, and New Orleans ..... I, 9
Searchlights ..... I, 8
Searchlights, insular possessions ..... I, 12
Sea walls and embankments ..... I, 10
Sea walls, defenses of Galveston, Tex ..... I, 10, 450; II, 1476
Sites ..... I, 8
Submarine mines ..... I, 11
Submarine mines, insular possessions ..... I, 12
Supplies for seacoast defenses ..... I, 10
Fort Leavenworth, Kans., engineer depot ..... I, 15, 16, 873
Fort Mason, Cal., engineer depot ..... I, 15, 17, 875
Fort Pierre, S. Dak. (*see* Missouri River) ..... I, 511; II, 1595
Fort Point channel, Boston, Mass., improvement of ..... I, 60, 911
Fort Snelling, Minn., bridge across Mississippi River to St. Paul ..... I, 861; III, 2475
Fosters Meadow (Hook Creek) Canal, N. Y., bridge across ..... I, 822, 825
Fox River, Wis:
Bridge at Appleton ..... I, 823
Bridge at Green Bay Harbor ..... I, 829
Harbor lines in Green Bay Harbor ..... I, 815
Improvement of ..... I, 622; III, 1907
Improvement below Depere, including Green Bay Harbor ..... I, 607; III, 1872
Operating and care of locks and dams ..... I, 623; III, 1909
Survey of Lake Winnebago for charting purposes ..... I, 624
Frametown, W. Va., bridge across Elk River ..... I, 820
Frankfort, Me., examination and survey of Marsh River (South Branch of the Penobscot) ..... I, 43
Frankfort, Mich., improvement of harbor ..... I, 663; III, 1981
Franklin, La.:
Examination and survey of waterway to Mermentau (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Improvement of waterway to Mermentau ..... I, 415; II, 1437
Fredericksburg, Va., monument to Gen. Hugh Mercer ..... I, 841; III, 2299
French Broad River, Tenn., improvement of ..... I, 531; II, 1645

G.

Galena River, Ill., operating and care of lock and dam ..... I, 496; II, 1574
Galleries, cable. *See* Fortifications.
Gallinas Creek, Cal., bridge across ..... I, 820
Galveston and Brazos Canal, Tex.:
Examination and survey (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Improvement of ..... I, 436, 442, 443; II, 1470, 1471
Operating and care ..... I, 443; II, 1471
Galveston Bay and Harbor, Tex.:
Construction of sea wall, embankment, and fill at Fort Crockett and of sea wall from Thirty-ninth to Forty-fifth streets ..... I, 10, 450; II, 1476
Defenses of ..... I, 5, 10, 11, 450; II, 1476
Dredges, operation of ..... II, 1477
Examination and survey of Galveston channel for enlargement and for extension farther west ..... I, 451
Examination and survey of harbor for 30-foot depth ..... I, 451
Examination and survey for waterway from the Rio Grande to Donaldsonville, La., via ..... I, 451
Examination and survey of waterway to Brazos River ..... I, 451
Improvement of channel across Hanna reef, Ladies Pass ..... I, 437; II, 1465
Improvement of Galveston channel from inner bar to Fifty-sixth street ..... I, 431; II, 1456
Improvement of Galveston-Texas City channel ..... I, 433; II, 1459
Improvement of harbor entrance ..... I, 429; II, 1453
Improvement of Port Bolivar channel ..... I, 433; II, 1460

Galveston Bay and Harbor, Tex.—Continued.
Improvement of waterway to Brazos River ..... I, 443; II, 1471
Improvement of waterway to Houston ..... I, 434; II, 1461
Improvement of West Bay ..... I, 436, 441, 443; II, 1469, 1471
Wreck off mouth of Clear Creek ..... I, 450
Galveston, Harrisburg and San Antonio Railway Company, bridges of ..... I, 825
Gary, Ind., bridge across Calumet River ..... I, 818
Gasconade River, Mo., improvement of ..... I, 515; II, 1603
Gauging:
Columbia River, Oreg. and Wash ..... I, 779; III, 2208
Michigan Lake, variations in surface level on east shore ..... I, 640
Mississippi River and principal tributaries .. I, 510, 812; II, 1593; III, 2610, 2648
Northern and Northwestern Lakes, levels and discharges. I, 853, 854; III, 2455, 2456
Gedney channel, New York Harbor, N. Y., improvement of ..... I, 148; II, 1025
Genesee River, N. Y. (*see* Charlotte Harbor) ..... I, 723; III, 2115
George Lake, St. Johns River, Fla. (*see* Volusia bar) ..... I, 330; II, 1310
George Orbin Bridge Company, bridge of ..... I, 827
Georges River, Me., improvement of ..... I, 31, 887
Georgetown County, S. C., bridge of ..... I, 826
Georgetown Harbor, D. C. *See* Washington.
Georgetown Harbor, S. C.:
Harbor lines in Sampit River ..... I, 815
Improvement of (*see* Winyah Bay) ..... I, 294; II, 1258
Georgia and Florida Railway, bridge of ..... I, 828
Gettman (canal boat), wreck of ..... I, 117, 982
Gettysburg National Park, Pa., memorial tablet to Abraham Lincoln. I, 841; III, 2299
Gladstone Harbor, Mich., improvement of ..... I, 605; III, 1869
Glencove Creek, N. Y., wreck at mouth ..... I, 146; II, 1020
Glencove Harbor, N. Y., improvement of ..... I, 128; II, 994
Gloucester, Mass., improvement of harbor ..... I, 49, 903
Gloucester, N. J., wreck off ..... I, 185; II, 1103
Goddell Bayou, La., removal of water hyacinths ..... I, 427; II, 1450
Golden, Georgia F. (schooner), wreck of ..... I, 262; II, 1219
Gosport Harbor, N. H. (*see* Isles of Shoals Harbor) ..... I, 40, 895
Government Printing Office, Washington, D. C., telegraph line to Departments and Capitol ..... I, 841; III, 2299
Government telegraph line, Washington, D. C ..... I, 841; III, 2299
Governor (steamer), wreck of ..... I, 146; II, 1020
Governors Island, New York Harbor, N. Y., enlargement of, etc ..... I, 153; II, 1037
Gowanus Bay, N. Y., improvement of ..... I, 151; II, 1034
Granby, S. C. *See* Congaree River.
Grand (Cabanosso) Bayou, La., bridge across ..... I, 821
Grand Calumet River, Ill. and Ind. *See* Calumet River.
Grande, Rio, Tex., examination and survey for waterway to Mississippi River at Donaldsonville, La ..... I, 451
Grand Haven Harbor, Mich., improvement of ..... I, 649; III, 1960
Grand Island, Niagara River, N. Y., wreck of steamer *Embury* ..... I, 725; III, 2112
Grand Lake, Mermentau River, La., improvement of Mermentau River and tributaries ..... I, 417; II, 1439
Grand Marais, Mich., improvement of harbor of refuge ..... I, 602; II, 1863
Grand Marais, Minn., improvement of harbor ..... I, 584; II, 1823
Grand Rapids, Wabash River, lock and dam ..... I, 576, 578; II, 1805, 1807
Grand River, La.:
Improvement of ..... I, 404; II, 1419
Removal of water hyacinths ..... I, 427; II, 1450
Grand River, Mich.:
Improvement of ..... I, 650; III, 1963
Improvement of Grand Haven Harbor ..... I, 649; III, 1960
Grand River, Ohio:
Bridge at Painesville ..... I, 824
Improvement of Fairport Harbor ..... I, 711; III, 2086
Wreck in Fairport Harbor ..... I, 716; III, 2096
Grant statue, Washington, D. C ..... I, 841; III, 2299
Gravesend Bay, N. Y., harbor lines ..... I, 814
Grays Harbor, Wash.:
Improvement of entrance ..... I, 781; III, 2211
Improvement of, between Aberdeen and the entrance, including dredge construction ..... I, 758, 783; III, 2168, 2212

Grays Harbor and Puget Sound Railway Company, bridge of ..... I, 828
Grays River, Wash., improvement of ..... I, 779; III, 2207
Great Egg Bay, N. J., bridge between Somers Point and Ocean City ..... I, 823
Great Harbor, Culebra Island, P. R., examination of ..... I, 807
Great Kanawha River, W. Va.:
Bridge at Charleston ..... I, 819
Improvement of ..... I, 562; II, 1749
Operating and care of locks and dams ..... I, 563; II, 1750
Great Lakes:
Bulletins ..... I, 854; III, 2454
Channels in waters connecting, examination and survey ..... I, 698
Channels in waters connecting, improvement of ..... I, 685; III, 2007, 2059
Commercial statistics, Sault Ste. Marie canals, Mich ..... I, 690; III, 2016, 2059
Connecting waters between Lakes Superior and Huron, supplemental survey report, with estimate, etc., in re new lock at St. Marys Falls Canal, Mich ..... I, 698
Control and regulation of waters of Niagara River, and preservation of Niagara Falls ..... I, 854; III, 2457
Discharges, table of (1860 to 1906) ..... I, 853; III, 2457
Navigation of, in 1841, conditions governing ..... I, 843
Project for future work of the Lake Survey ..... I, 850
Surveys and charts ..... I, 842, 848, 852, 853; III, 2443, 2459
Water levels ..... I, 854; III, 2455, 2456
Water levels on east shore of Lake Michigan, variations in ..... I, 640
Great Northern Railway Company, bridge of ..... I, 826
Great Pedee River, S. C., improvement of ..... I, 293; II, 1256
Great Salt Pond, Block Island, R. I.:
Improvement of ..... I, 92, 951
Wreck near entrance ..... I, 94, 954
Great Sodus Bay, N. Y., improvement of harbor ..... I, 727; III, 2119
Great South Bay, N. Y.:
Improvement of ..... I, 136; II, 1005
Wreck off Sampawams Point ..... I, 145; II, 1019
Green Bay (arm of Lake Michigan), Wis., wreck near Tail Point light. I, 624; III, 1915
Green Bay Harbor, Fox River, Wis.:
Bridge (city) at Mason street ..... I, 829
Harbor lines ..... I, 815
Improvement of ..... I, 607; III, 1872
Greene County, Miss., bridges of ..... I, 823, 826
Green Jacket shoal, Providence River, R. I., removal of ..... I, 86, 942
Green River, Ky.:
Bridge at Munfordville ..... I, 822
Improvement above mouth of Big Barren River ..... I, 580; II, 1809
Operating and care of locks and dams ..... I, 581; II, 1810
Greenwich Harbor, Conn., improvement of ..... I, 115, 978
Grossetete Bayou, La., removal of water hyacinths ..... I, 427; II, 1450
Grounds, public, District of Columbia ..... I, 841; III, 2299
Guadalupe River, Tex.:
Examination and survey for channel from Aransas Pass to Victoria and to Cuero ..... I, 451
Improvement of, from Victoria to Aransas Pass—Pass Cavallo channel ..... I, 443, 444; II, 1473
Guam Harbor, Mariana Islands, defenses of ..... I, 12, 15
Guantanamo Bay, Cuba, defenses of ..... I, 11, 12, 15
Gulf of Mexico, survey for 14-foot waterway to St. Louis, Mo., and thence to Lockport (Chicago), Ill., including report on water power and land drainage ..... I, 634, 812; III, 1933, 2657
Gulfport Harbor, Miss.:
Diversion of improvement funds to construction of dredge for coast harbors ..... I, 394
Examination and survey of anchorage basin and of channel to Ship Island anchorage ..... I, 395
Improvement of channel to Ship Island Harbor ..... I, 390; II, 1392
Gulf States, removal of water hyacinths:
From Florida waters ..... I, 346; II, 1333
From Louisiana waters ..... I, 427; II, 1450
From Texas waters ..... I, 427; II, 1450

Gull Lake, Minn., construction of reservoir dam ..... I, 499; II, 1581
Gun batteries. *See* Fortifications.
Gut, The (between North and South Hero islands), Lake Champlain, Vt.:
Bridge across ..... I, 828
Improvement of ..... I, 71

H.

Hackensack River, N. J.:
Bridge at Jersey City ..... I, 820
Bridge near Snake Hill ..... I, 827
Hales bar, Tennessee River, construction of lock and dam ..... I, 528; II, 1628
Hammond, Ind.:
See also Calumet River.
Bridge across Calumet River ..... I, 818
Hammond, George I., et al., bridges of ..... I, 821
Hampton Creek, Va.:
Harbor lines ..... I, 815
Wreck in ..... I, 263; II, 1219
Hampton Roads, Va.:
Construction of piers and dredging at Jamestown Exposition grounds ..... I, 247; II, 1195
Defenses of ..... I, 5
Improvement of ..... I, 253; II, 1205
Improvement of approaches to Norfolk Harbor ..... I, 250; II, 1201
Wreck off Sewell Point ..... I, 262; II, 1219
Hampton (schooner), wreck of ..... I, 185; II, 1104
Hanna reef, Ladies Pass, Tex., improvement of channel ..... I, 437; II, 1465
Harbor Beach (Sandbeach), Mich.:
Improvement of harbor of refuge ..... I, 674; III, 1994
Water levels ..... I, 854; III, 2455, 2456
Wreck in Lake Huron near ..... I, 698; III, 2057
Harbor Cove, Gloucester, Mass. (*see* Gloucester Harbor) ..... I, 49, 903
Harbor lines, establishment of ..... I, 814
Harbors and rivers. *See* Rivers and harbors.
Harlem (Bronx) Kills, N. Y. *See* Harlem River.
Harlem River, N. Y.:
Improvement of ..... I, 133; II, 1001
Wreck in ..... I, 146; II, 1021
Harlowe Creek, N. C., improvement of waterway via ..... I, 272; II, 1232
Harrison, N. J., harbor lines ..... I, 815
Hastings upon Hudson, N. Y., harbor lines ..... I, 815
Havre de Grace, Md.:
Bridge across Susquehanna River ..... I, 828
Improvement of Susquehanna River ..... I, 213; II, 1144
Hawaiian Islands:
Defenses of ..... I, 11, 12, 14, 15
Hilo Harbor, examination and survey ..... I, 806
Hilo Harbor, improvement of ..... I, 805; III, 2236
Honolulu Harbor, improvement of ..... I, 803; III, 2233
Honolulu Harbor, reclamation of Quarantine Island ..... I, 804; III, 2236
Honolulu Harbor, survey of ..... I, 806
Hay (West) Harbor, Fishers Island, N. Y., examination and survey ..... I, 118
Hay Lake channel, St. Marys River, Mich.:
Examination and survey of channels in waters connecting Great Lakes ..... I, 698
Improvement of ..... I, 691; III, 2036
Improvement of channels in waters connecting Great Lakes ..... I, 685; III, 2007, 2059
Hell Gate, East River, N. Y., improvement of ..... I, 131; II, 999
Hempstead Harbor, N. Y.:
Improvement of (*see* Glencove Harbor) ..... I, 128; II, 994
Wreck in ..... I, 146; II, 1020
Hendricks Harbor, Me., examination and survey ..... I, 43
Hennepin Canal, Ill. *See* Illinois and Mississippi Canal.
Herbert Creek, Va., harbor lines ..... I, 815
Hero (lighter), wreck of ..... I, 147; II, 1022
Herring Bay, Md., bridges across Traceys and Rock Hole creeks, at head of ..... I, 827

Herring River, Mass., wreck off ..... I, 94, 953
Herr Island, Allegheny River, Pa., lock and dam at ..... I, 548, 549; II, 1699, 1703
Higgins Slough, Wash., bridge across ..... I, 826
Highway bridges, Potomac River, Washington, D. C.:
  Aqueduct Bridge ..... I, 830; III, 2271
  Replacing Long Bridge ..... I, 832; III, 2273
Highways. *See* Roads.
Hill, Charles G. (barge), wreck of ..... I, 146; II, 1021
Hillsboro Bay and River, Fla.:
  Bridge across bay at Tampa ..... I, 822
  Bridge across inlet of bay near Tampa ..... I, 824
  Bridge across river about 11 miles above mouth ..... I, 824
  Harbor lines at Tampa ..... I, 815
  Improvement of ..... I, 341; II, 1326
  Wrecks in river at Tampa ..... I, 347
Hilo Harbor, Hawaii:
  Examination and survey ..... I, 806
  Improvement of ..... I, 805; III, 2236
Hingham Harbor, Mass., improvement of ..... I, 66, 920
Hiwassee River, Tenn., improvement of ..... I, 534; II, 1649
Hogans Creek, Jacksonville, Fla., harbor lines in St. Johns River at ..... I, 815
Holland Harbor, Mich., improvement of ..... I, 647; III, 1956
Holmes River, Fla., improvement of ..... I, 359; II, 1350
Holston River, Va. and Tenn.:
  Bridge at Brabsons Ferry, Tenn ..... I, 821
  Bridges across North and South forks near Kingsport, Tenn ..... I, 817
  Bridge near Surgoinsville, Tenn ..... I, 823
  Improvement of ..... I, 535; II, 1651
Holston River Railway Company, bridge of ..... I, 823
Homochitto River, Miss., improvement of ..... I, 409; II, 1431
Honolulu Harbor, Hawaii:
  Defenses of ..... I, 11, 12, 15
  Improvement of ..... I, 803; III, 2233
  Reclamation of Quarantine Island ..... I, 804; III, 2236
  Survey of ..... I, 806
Hook Creek (Fosters Meadow) Canal, N. Y., bridge across ..... I, 822, 825
Hookerton, N. C., bridge across Contentnia Creek ..... I, 827
Hookton, Cal. (*see* Humboldt Harbor) ..... I, 748; III, 2149
Hoquarten Slough, Oreg. (*see* Tillamook Bay) ..... I, 757; III, 2166
Hoquiam, Wash., bridge across Hoquiam River ..... I, 826
Hoquiam River, Wash., bridge at Hoquiam ..... I, 826
Horn Island Harbor and Pass, Miss.:
  Improvement of harbor (*see* Pascagoula River) ..... I, 383; II, 1385
  Improvement of pass ..... I, 388; II, 1390
Hospital Point, Norfolk Harbor, Va., removal of ..... I, 251; II, 1202
Housatonic River, Conn.:
  Improvement of ..... I, 107, 969
  Improvement of Milford Harbor ..... I, 105, 969
Houston, Tex., improvement of waterway to Galveston ..... I, 434; II, 1461
Howard University reservoir, Washington, D. C ..... I, 836; III, 2283
Hudson County, N. J., bridges of, across Hackensack and Passaic rivers ..... I, 820
Hudson River, N. Y. (*see also* New York City and Harbor):
  Bridge at Poughkeepsie ..... I, 821
  Harbor lines at Van Wies Point, below Albany, at Starbuck and Big Stony islands, Troy, and at Hastings upon Hudson ..... I, 814, 815
  Improvement of ..... I, 138; II, 1006
  Peekskill Harbor, improvement of ..... I, 141; II, 1014
  Rondout Harbor, improvement of ..... I, 140; II, 1014
  Saugerties Harbor, improvement of ..... I, 139; II, 1012
  Tarrytown Harbor, improvement of ..... I, 143; II, 1017
  Waterford, examination and survey to Troy ..... I, 148
  Wrecks in ..... I, 145, 146, 147; II, 1019, 1020, 1021, 1022
Hulton Ferry, Pa., bridge across Allegheny River ..... I, 819
Humboldt Harbor and Bay, Cal., improvement of ..... I, 748; III, 2149
Humptulips River, Wash., bridge across ..... I, 826
Huntington Harbor, N. Y., improvement of ..... I, 127; II, 993
Huron Harbor, Ohio, improvement of ..... I, 703; III, 2070

Huron Lake (*see also* Northern and Northwestern Lakes):
Survey of connecting waters between Lake Superior and, supplemental report, with estimate, etc., in re new lock at St. Marys Falls Canal, Mich. I, 698
Water levels and discharges ..... I, 853, 854; III, 2455, 2456, 2457
Wrecks in ..... I, 698; III, 2057, 2058
Hutchinson Island, Savannah Harbor, Ga., bridge at ..... I, 829
Hutchinson River (East Chester Creek), N. Y., improvement of ..... I, 123; II, 989
Hyacinths, water, removal of:
From Florida waters ..... I, 346; II, 1333
From Louisiana waters ..... I, 427; II, 1450
From Texas waters ..... I, 427; II, 1450
Hyannis, Mass., improvement of harbor of refuge ..... I, 75, 930
Hydraulic mining in California ..... I, 809; III, 2253
Hydraulics. *See* Gauging *and* Great Lakes.
Hydrology. *See* Gauging *and* Great Lakes.

I.

Iberia Parish, La., bridge of ..... I, 827
Iberville Parish, La., bridge of ..... I, 826
Illinois and Mississippi Canal, Ill.:
Construction of ..... I, 637; III, 1940
Improvement of pool between Locks 29 and 35, Rock River ..... I, 495; II, 1573
Operating and care ..... I, 495; II, 1572
Illinois and Northern Railway Company, bridge of ..... I, 825
Illinois River, Ill.:
Bridge at Peoria (lower free wagon bridge) ..... I, 821
Bridge at Utica ..... I, 825
Harbor lines at Peoria ..... I, 815
Improvement of ..... I, 635; III, 1935
Operating and care of locks and dams ..... I, 637; III, 1938
Operating snag boats and dredge boats ..... I, 490; II, 1555
Survey for 14-foot waterway from Lockport (Chicago), Ill., to St. Louis, Mo., and thence to mouth of the Mississippi, including report on water power and land drainage ..... I, 634, 812; III, 1933, 2657
Indiana chute, Falls of Ohio River, improvement of ..... I, 570; II, 1795
Indian River, Del., examination and survey ..... I, 208
Indian River, Fla., improvement of ..... I, 332; II, 1312
Inland waterways. *See* Canals *and* Waterways.
Inman-Poulsen Logging Company, bridge of ..... I, 827
Inside routes. *See* Canals *and* Waterways.
Insular possessions:
See also Alaska.
Defenses of ..... I, 11, 12, 14, 15
Great Harbor, Culebra Island, P. R., examination of ..... I, 807
Hilo Harbor, Hawaii, examination and survey ..... I, 806
Hilo Harbor, Hawaii, improvement of ..... I, 805; III, 2236
Honolulu Harbor, Hawaii, improvement of ..... I, 803; III, 2233
Honolulu Harbor, Hawaii, reclamation of Quarantine Island ..... I, 804; III, 2236
Honolulu Harbor, Hawaii, survey of ..... I, 806
Mayaguez Harbor, P. R., examination of ..... I, 807
Ponce Harbor, P. R., examination of ..... I, 807
Ponce Harbor, P. R., wreck in ..... I, 807; III, 2240
Porto Rico, erection of structures in navigable waters of ..... I, 816
San Juan Harbor, P. R., improvement of ..... I, 806; III, 2239
International Commission, Permanent, of Congresses of Navigation ..... I, 814
Island possessions. *See* Insular possessions.
Isles of Shoals, Me., improvement of harbor at ..... I, 40, 895
Istokpoga Creek, Fla. (*see* Kissimmee River) ..... I, 335; II, 1316

J.

Jacksonville, Fla.:
Harbor lines in St. Johns River at Hogans Creek ..... I, 815
Improvement of St. Johns River at ..... I, 329; II, 1309
Jamaica Bay, N. Y., examination and survey for channel to Coney Island channel, via Rockaway Inlet ..... I, 148
James River, Va.:
See also Hampton Roads.
Construction of permanent landing pier at Jamestown Island ..... I, 249; II, 1198

James River, Va.—Continued.
Improvement of ..... I, 245; II, 1188
Wreck at Richmond ..... I, 249; II, 1199
Jamestown Exposition, Va., construction of piers and dredging in connection with ..... I, 247, 249; II, 1195, 1198
Jeanerette, La., bridge across Bayou Teche at Bayside plantation ..... I, 828
Jefferson, Tex., improvement of Cypress Bayou ..... I, 455; II, 1489
Jefferson County, Ark., bridge of ..... I, 817
Jefferson, Thomas, statue of ..... I, 841; III, 2299
Jekyl Creek, Ga., improvement of waterway via ..... I, 322; II, 1295
Jersey City, N. J.:
See also New York Bay, City, and Harbor.
Bridge across Hackensack River ..... I, 820
John L. Roper Lumber Company, bridge of ..... I, 823
Johnson Creek, N. C., bridge across ..... I, 824
Johnsons Bayou, La., improvement of ..... I, 421; II, 1442
Johnsons Creek, or River, Conn.:
Improvement of (*see* Bridgeport Harbor) ..... I, 108, 972
Wrecks in ..... I, 117, 982
Joint resolutions of 59th Congress, 2d session, affecting Corps of Engineers. III, 2477
Jones County, N. C., bridge of ..... I, 822
Jones Creek, Va., harbor lines ..... I, 815
Jones, John Paul, monument to ..... I, 841; III, 2299
Jordan, Geo. V. (schooner), wreck of ..... I, 94, 953
Jordan River, Miss., improvement of ..... I, 391; II, 1394
Judith, Point, R. I.:
Construction of harbor of refuge ..... I, 89, 947
Improvement of pond entrance ..... I, 90, 949

K.

Kalamazoo River, Mich., improvement of ..... I, 645; III, 1952
Kampsville lock and dam, Illinois River, Ill ..... I, 635, 637; III, 1935, 1938
Kanawha Bridge and Terminal Company, bridge of ..... I, 819
Kanawha River, W. Va.:
Bridge at Charleston ..... I, 819
Improvement of ..... I, 562; II, 1749
Operating and care of locks and dams ..... I, 563; II, 1750
Kansas City, Mo. and Kans. *See* Kansas *and* Missouri rivers.
Kansas City Belt Railway Company, bridge of ..... I, 824
Kansas City, St. Joseph and Excelsior Springs Railway Company, bridge of .. I, 818
Kansas River, Kans., bridge at Kansas City ..... I, 824
Kaskaskia River, Ill., bridge near Baldwin ..... I, 821
Kaw (Kansas) River, Kans., bridge at Kansas City ..... I, 824
Kelley Island, near Marblehead light-house, Ohio, wreck near ..... I, 716; III, 2096
Kennebec River, Me.:
Defenses of ..... I, 5
Examination and survey from mouth to Gardiner ..... I, 43
Improvement of ..... I, 32, 888
Kennebunk River, Me., improvement of ..... I, 39, 894
Kennerdell, Pa., bridge across Allegheny River ..... I, 822
Kenosha Harbor, Wis., improvement of ..... I, 620; III, 1903
Kensington and Eastern Railroad Company, bridge of ..... I, 818
Kentucky and West Virginia Bridge Company, bridge of ..... I, 819
Kentucky River, Ky.:
Bridges across North and South forks at Beattyville ..... I, 821
Improvement of ..... I, 568; II, 1781
Operating and care of locks and dams ..... I, 569; II, 1785
Keokuk (Des Moines Rapids) Canal and dry dock, Mississippi River, operating and care ..... I, 494; II, 1568
Kewaunee Harbor and River, Wis.:
Improvement of ..... I, 611; III, 1882
Wrecks in ..... I, 624; III, 1916
Keweenaw Bay and Point, Mich., improvement and care of waterway to Lake Superior ..... I, 597, 599; II, 1853
Keyport Harbor, N. J., improvement of ..... I, 163; II, 1056

Key West Harbor, Fla.:
Defenses of ..... I, 5
Improvement of ..... I, 334; II, 1315
Kill van Kull, N. Y. and N. J.:
Examination for channel in New York Bay to vicinity of Liberty (Bedloe) Island west of Robbins reef light-house ..... I, 175
Examination and survey for channel north of Shooters Island to channel near Corner Stake light, including reef at Bergen Point light ..... I, 175
Improvement of Staten Island-New Jersey channel ..... I, 157, 158; II, 1048
Wreck in ..... I, 174; II, 1077
Kings Mountain battle ground, S. C., erection of monument ..... I, 861
Kingsport, Tenn., bridges across North and South forks of Holston River ..... I, 817
Kingston, R. I. *See* Point Judith Harbor and Pond.
Kingston Bay, Mass., improvement of Duxbury Harbor ..... I, 68, 922
Kinnikinnick River, Wis. (*see* Milwaukee Harbor) ..... I, 618; III, 1897
Kirby, Thomas, dam across Mississippi River at Bemidji, Minn ..... I, 830
Kissimmee Lake and River, Fla.:
Improvement of ..... I, 335; II, 1316
Removal of water hyacinths ..... I, 346; II, 1333
Klickitat River, Wash., bridge across ..... I, 825
Kosciuszko, Gen. Thaddeus, statue of ..... I, 841; III, 2299
Koyen, Edith H. (schooner), wreck of ..... I, 624; III, 1916

L.

La Conner, Wash.:
Bridge across Swinomish Slough ..... I, 825
Improvement of Swinomish Slough ..... I, 796; III, 2224
Ladies Pass, Tex., improvement of channel across Hanna reef ..... I, 437; II, 1465
Lafayette County, Fla.:
Bridge across Suwanee River at Branford ..... I, 820
Bridge across Suwanee River at Lurayville ..... I, 822
Lafayette Parish, La., bridge of ..... I, 826
Lafourche Basin levee board of Louisiana, lock and dam in Bayou Lafourche. I, 830
Lafourche Bayou, La.:
Improvement of ..... I, 403; II, 1418
Lock and dam of Atchafalaya Basin and Lafourche Basin levee boards.. I, 830
Lagrange Bayou, Fla. (*see* Holmes River) ..... I, 359; II, 1350
Lagrange lock and dam, Illinois River, Ill ..... I, 635, 637; III, 1935, 1938
Lake Charles and Northern Railroad Company, bridge of ..... I, 825
Lake County, Ind., bridge of ..... I, 818
Lake River, Wash., bridge near Ridgefield ..... I, 827
Lakes, Great. *See* Great Lakes.
Lake Survey. *See* Northern and Northwestern Lakes.
Lake Washington Canal, Wash. *See* Washington Lake.
L'Anguille River, Ark., improvement of ..... I, 484; II, 1531
Laporte County, Ind., bridge of ..... I, 822
Larchmont Harbor, N. Y., improvement of ..... I, 120; II, 986
Lasalle County, Ill., bridge of ..... I, 825
La Trappe River, Md., improvement of ..... I, 222; II, 1154
Laurel (barge), wreck of ..... I, 249; II, 1199
Laws of 59th Congress, 2d session, affecting Corps of Engineers ..... III, 2477
Leaf River, Miss.:
Bridge near Beaumont ..... I, 824
Improvement of ..... I, 386; II, 1387
Leavenworth, Fort, Kans., engineer depot ..... I, 15, 16, 873
Leech Lake, Minn.:
Construction of reservoir dam ..... I, 499; II, 1581
Operating and care of reservoir dam ..... I, 502; II, 1584
Lee County, Fla., bridge of ..... I, 827
Lee Slough, Apalachicola River, Fla., improvement of ..... I, 351; II, 1339
Legislation of 59th Congress, 2d session, affecting Corps of Engineers ..... III, 2477
Lehrton, Miss., bridge across Big Sunflower River ..... I, 817
Lemon Creek, N. Y. (*see* Staten Island-New Jersey channel) ..... I, 158; II, 1050
Leonardtown Harbor, Md. (*see* Breton Bay) ..... I, 233; II, 1171
Levels, water. *See* Water-level observations.
Levisa Fork, Big Sandy River, Ky.:
Bridge at Prestonsburg ..... I, 826
Improvement of ..... I, 565; II, 1771

Lewes, Del., iron pier in Delaware Bay, maintenance and repair..... I, 183; II, 1102
Lewis River, Wash.:
Bridge near Woodland..... I, 827
Improvement of..... I, 777; III, 2204, 2206
Lexington, Mich., wreck off..... I, 698; III, 2057
Liberty (barge), wreck of..... I, 624; III, 1916
Liberty (Bedloe) Island, New York Bay, N. Y., examination for channel west of Robbins reef light-house to Kill van Kull..... I, 175
Life-saving exhibit, Jamestown Exposition, Va., dredging of Bush Creek for accommodation of..... I, 247; II, 1195
Lincoln, Abraham, memorial tablet at Gettysburg National Park, Pa. I, 841; III, 2299
Linden (steamer), wreck of..... I, 698; III, 2057
Linehan, Bart E. (steamer), wreck of..... I, 525; II, 1620
Little Annemessex River, Md., improvement of Crisfield Harbor..... I, 227; II, 1161
Little Bay de Noc, Mich. (*see* Gladstone Harbor)..... I, 605; III, 1869
Little D'Arbonne Bayou, La. (*see* D'Arbonne Bayou)..... I, 463, 466; II, 1504
Little Fork, Minn., bridge across Little Fork River..... I, 826
Little Fork River, Minn.:
Bridge near Little Fork..... I, 826
Examination of..... I, 511
Little Harbor, Woods Hole, Mass., improvement of..... I, 78, 935
Little Harbor, N. H., improvement of harbor of refuge..... I, 42, 898
Little Kanawha River, W. Va.:
Bridge at Parkersburg..... I, 826
Improvement of..... I, 560; II, 1743
Operating and care of locks and dams..... I, 562; II, 1746
Little Mud River, Ga., improvement of waterway via..... I, 322; II, 1295
Little Narragansett Bay, R. I. and Conn. (*see* Pawcatuck River)..... I, 95, 955
Little Pass, Soda Lake, La. (*see* Cypress Bayou.)
Little Pedee River, S. C., improvement of..... I, 290; II, 1255
Little Pigeon River, Tenn., improvement of..... I, 531; II, 1645
Little River, Ark., bridge near Folmina (White Cliffs)..... I, 827
Little River (part of Red River), La. (*see* Red River below Fulton).. I, 458; II, 1493
Little Sarasota Bay, Fla., improvement of..... I, 338; II, 1321
Little Sodus Bay, N. Y., improvement of harbor..... I, 728; III, 2121
Little Tallahatchie River, Miss. (*see* Tallahatchie River)..... I, 469, 470; II, 1509
Little Tennessee River, Tenn., improvement of (*see* Tennessee River above Chattanooga)..... I, 527; II, 1624
Little White Salmon River, Wash., bridge across..... I, 825
Lockport, Ill., survey for 14-foot waterway to St. Louis, Mo., and thence to mouth of the Mississippi..... I, 634, 812; III, 1933, 2657
Locks. *See* Canals, Rivers and Harbors, *and* Waterways.
Locust Fork, Black Warrior River, Ala., bridge near Short Creek..... I, 824
Log booms, permits for construction of..... I, 829
Long Bayou, La., removal of water hyacinths..... I, 427; II, 1450
Long Beach, Cal.:
Bridges across Cerritos Slough..... I, 821, 823
Bridge across San Gabriel (Los Angeles) River..... I, 829
Long Bridge, Potomac River, Washington, D. C., highway bridge replacing..... I, 832; III, 2273
Long Cove, Me., examination and survey..... I, 43
Longfellow, Henry W., monument to..... I, 841; III, 2299
Long Island Railroad Company, bridge across Fosters Meadow (Hook Creek) Canal, N. Y..... I, 822, 825
Long Island Sound, N. Y., and Conn.:
Defenses of eastern entrance..... I, 5
Wreck off Montauk light..... I, 117, 982
Long rock, Echo Bay Harbor, N. Y. *See* Echo Bay Harbor.
Long Tom River, Oreg. (*see* Willamette River above Portland)..... I, 768; III, 2185
Lorain Harbor, Ohio, improvement of..... I, 706; III, 2074
Lorillard, N. J., wreck near..... I, 174; II, 1076
Los Angeles Dock and Terminal Company, bridge of..... I, 821
Los Angeles River, Cal. *See* Wilmington Harbor.
Louisa, Ky. *See* Big Sandy River.
Louisiana, State of, removal of water hyacinths..... I, 427; II, 1450
Louisville, Ky. (*see* Louisville and Portland Canal)..... I, 570, 575; II, 1795, 1800
Louisville and Portland Canal, Ky.:
Enlargement of..... I, 570; II, 1795
Operating and care..... I, 575; II, 1800

Loutre, Pass a, Mississippi River, La., closing crevasse in ..... I, 396; II, 1399
Lubec Channel, Me., improvement of ..... I, 21, 877
Ludille (steamer), wreck of ..... I, 716; III, 2096
Ludington Harbor, Mich.:
Bridge (city) at Washington street ..... I, 828
Improvement of ..... I, 657; III, 1974
Lumberton Branch, Rancocas River, N. J., improvement of ..... I, 185; II, 1107
Lurayville, Fla., bridge across Suwanee River ..... I, 822
Lyme, Conn., bridge across Duck River ..... I, 823
Lynch River, S. C., improvement of ..... I, 292; II, 1256
Lynn Harbor, Mass., improvement of ..... I, 52, 906

M.

McClellan statue, Washington, D. C ..... I, 841; III, 2299
McClellanville, S. C., improvement of waterway to Charleston ..... I, 302; II, 1265
McCormick (tug), wreck of ..... I, 716; III, 2096
McGirts Creek, Fla., bridge across ..... I, 828
McKees Rocks, Pa., bridge across Chartiers Creek ..... I, 827
Mackeys Creek, N. C., bridges across ..... I, 820, 824
Mackeys Ferry, N. C., bridge across Mackeys Creek ..... I, 820
Maçon Bayou, La., improvement of ..... I, 463, 465; II, 1503
Main Ship channel, New York Harbor, N. Y., improvement of ..... I, 148; II, 1025
Malden River, Mass., improvement of ..... I, 54, 908
Mall, the, Washington, D. C ..... I, 841; III, 2299
Mamaroneck Harbor, N. Y., improvement of ..... I, 119; II, 985
Manasquan River, N. J., improvement of ..... I, 173; II, 1076
Manatee County, Fla., bridge of ..... I, 822
Manatee River, Fla., improvement of ..... I, 339; II, 1322
Manchac Bayou, La., improvement of ..... I, 413; II, 1435
Manchester Harbor, Mass., improvement of ..... I, 50, 904
Manhattan Borough, N. Y. *See* New York City and Harbor.
Manila Bay, Philippine Islands, defenses of ..... I, 11, 12, 15
Manistee Harbor and River, Mich., improvement of ..... I, 659; III, 1976
Manistique Harbor, Mich., improvement of ..... I, 604; III, 1867
Manitowoc Harbor and River, Wis.:
Bridge (city) at Park and Center streets ..... I, 825
Harbor lines ..... I, 815
Improvement of ..... I, 613; III, 1886
Manokin River, Md., improvement of ..... I, 222; II, 1155
Mantua Creek, N. J., improvement of ..... I, 188; II, 1109
Maple Cypress, N. C., bridge across Neuse River ..... I, 822
Maps:
Military and other ..... I, 858
Minnetonka Lake, Minn ..... I, 510
Northern and Northwestern Lakes ..... I, 842, 848, 852, 853; III, 2443, 2459
Winnebago Lake, Fox River, Wis ..... I, 624
Marblehead light-house, Lake Erie, Ohio, wrecks near ..... I, 716; III, 2096
Marcushook, Pa., improvement of ice harbor in Delaware River ..... I, 182; II, 1101
Mare Island Straits, Cal., wreck in ..... I, 749; III, 2151
Mariana Islands, Pacific Ocean, defenses of Guam ..... I, 12, 15
Marlboro, N. Y., wreck opposite ..... I, 146; II, 1021
Marquette Bay and Harbor, Mich.:
Construction of harbor of refuge in bay ..... I, 601; II, 1862
Improvement of harbor ..... I, 599; II, 1860
Water levels ..... I, 854; III, 2455, 2456
Marsh River, Me., examination and survey at Frankfort ..... I, 43
Marthas Vineyard, Mass. *See* Vineyard Haven Harbor.
Mason, Fort, Cal., engineer depot ..... I, 15, 17, 875
Massachusetts Bay, Mass. *See* Boston Harbor.
Massachusetts, State of, dam across Mystic River at Medford ..... I, 829
Massena (steamer), wreck of ..... I, 733; III, 2129
Matagorda Bay, Tex.:
Examination, etc., for channel from Pass Cavallo to Aransas Pass (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Examination, etc., for waterway from the Rio Grande to Mississippi River, via ..... I, 451
Improvement of channel from Pass Cavallo to Aransas Pass .. I, 443, 444; II, 1472

Matawan Creek, N. J.:
Improvement of ..... I, 164; II, 1059
Improvement of Keyport Harbor ..... I, 163; II, 1056
Mattaponi River, Va., improvement of ..... I, 236; II, 1174
Mattituck Harbor, N. Y., improvement of ..... I, 126; II, 992
Maumee Bay and River, Ohio:
Bridge at Toledo ..... I, 824
Improvement of Toledo Harbor ..... I, 699; III, 2061
Mayaguez (tug), wreck of ..... I, 807; III, 2240
Mayaguez Harbor, P. R., examination of ..... I, 807
Mayflower (steamer), wreck of ..... I, 525; II, 1620
May, William H., et al., bridge of ..... I, 826
Medford, Mass., dam across Mystic River near Cradock Bridge ..... I, 829
Media, Pa., bridge across Darby Creek ..... I, 825
Meherrin River, N. C., improvement of ..... I, 261; II, 1217
Melville, La., bridge across Atchafalaya River ..... I, 821
Memorials, statues, etc. *See* Statues, memorials, etc.
Memphis, Paris and Gulf Railroad Company, bridge of ..... I, 827
Menominee Harbor and River, Mich. and Wis., improvement of ..... I, 605; III, 1870
Menominee River, Milwaukee, Wis., improvement of (*see* Milwaukee Harbor) ..... I, 618; III, 1897
Mercer, Gen. Hugh, monument to ..... I, 841; III, 2299
Mermentau, La. *See* Mermentau River.
Mermentau River, La.:
Examination and survey for waterway to Franklin (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Examination, etc., for waterway to Mississippi River (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Improvement of, including tributaries ..... I, 417; II, 1439
Improvement of waterway to Franklin ..... I, 415; II, 1437
Merrimac River, Mass.:
Examination and survey ..... I, 74
Improvement of ..... I, 45, 901
Improvement of Newburyport Harbor ..... I, 44, 899
Mexico, Gulf of:
Removal of water hyacinths from Florida tributaries ..... I, 346; II, 1333
Removal of water hyacinths from Louisiana tributaries ..... I, 427; II, 1450
Removal of water hyacinths from Texas tributaries ..... I, 427; II, 1450
Survey for 14-foot waterway to St. Louis, Mo., and thence to Lockport (Chicago), Ill., including report on water power and land drainage ..... I, 634, 812; III, 1933, 2657
Miami, Fla., improvement of Biscayne Bay ..... I, 332; II, 1313
Michigan City Harbor, Ind.:
Bridge across Trail Creek ..... I, 822
Improvement of ..... I, 632; III, 1930
Michigan Lake (*see also* Northern and Northwestern Lakes):
Canal to Sturgeon Bay, improvement of, including harbor of refuge ..... I, 608; III, 1874
Canal to Sturgeon Bay, operating and care ..... I, 610; III, 1880
Water levels and discharges ..... I, 853, 854; III, 2455, 2456, 2457
Water levels on east shore, variations in ..... I, 640
Waterway 14 feet deep from Lockport (Chicago), Ill., to St. Louis, Mo., and thence to the Gulf, survey, including report on water power and land drainage ..... I, 634, 812; III, 1933, 2657
Middle Neebish channel, St. Marys River, Mich., improvement of ..... I, 691; III, 2036, 2059
Milan, Ill. *See* Illinois and Mississippi Canal.
Miles City, Mont., bridge across Yellowstone River ..... I, 817
Milford Harbor, Conn., improvement of ..... I, 105, 969
Milford Haven, Va., improvement of harbor at ..... I, 244; II, 1187
Mill Creek, or River, New Haven, Conn. (*see* New Haven Harbor) ..... I, 102, 964
Mill Creek, Southport, Conn. (*see* Southport Harbor) ..... I, 114, 977
Miller Bay, Lake Winnebago, Wis. (*see* Fox River) ..... I, 622; III, 1907
Millers Ferry, Miss., bridge across Chickasahay River ..... I, 826
Millers Island, Holston River, Tenn., bridge at ..... I, 823
Mill River, New Haven, Conn., improvement of ..... I, 102, 964
Mill River, Stamford, Conn. (*see* Stamford) ..... I, 113, 976
Mills, Nelson (steamer), wreck of ..... I, 698; III, 2057

Milwaukee Bay, Harbor, and River, Wis.:
Bridge across Burnhams Canal ..... I, 823
Bridge across South Menominee Canal (city bridge) ..... I, 824
Improvement of, including harbor of refuge ..... I, 616; III, 1893
Improvement of inner harbor ..... I, 618; III, 1897
Water levels ..... I, 854; III, 2455, 2456
Mines, submarine. *See* Fortifications.
Mingo Bridge, S. C., bridge across Mingo Creek ..... I, 826
Mingo Creek, S. C.:
Bridge across ..... I, 826
Improvement of ..... I, 296; II, 1260
Minim Creek-Estherville Canal, S. C., improvement of ..... I, 297; II, 1260
Mining casemates. *See* Fortifications.
Mining, hydraulic, in California ..... I, 809; III, 2253
Minneapolis, Minn. *See* Mississippi River.
Minneapolis and Rainy River Railway Company, bridge of ..... I, 820
Minneapolis, St. Paul and Sault Ste. Marie Railway Company, bridge of ..... I, 819
Minnesota River, Minn.:
Improvement of ..... I, 504; II, 1588
Survey of Big Stone Lake and Lake Traverse for reservoir dam .. I, 509; II, 1593
Minnetoka Lake, Minn., survey of, for charting purposes ..... I, 510
Mishaum Point, Mass., wreck off ..... I, 94, 953
Mispillion River, Del., improvement of ..... I, 201; II, 1127
Mississippi coast, construction of dredge for harbors on ..... I, 394
Mississippi River:
Augusta, Minn., dam at ..... I, 829
Bemidji, Minn., dam at ..... I, 830
Brainerd to Grand Rapids, Minn., improvement from ..... I, 499; II, 1581
Cairo, Ill., to Head of Passes, improvement, surveys, etc ..... I, 812; III, 2605
Cairo, Ill., to Missouri River, improvement from ..... I, 487; II, 1539
Cape Girardeau, Mo., to Head of Passes, levees ..... I, 813; III, 2605
Chicago (Lockport), Ill., to St. Louis, Mo., and thence to the Gulf. *See* St. Louis, *infra*.
Clinton, Iowa, bridge at ..... I, 819
Des Moines Rapids Canal and dry dock, operating and care ..... I, 494; II, 1568
Discharge measurements, including tributaries. I, 510, 812; II, 1593; III, 2610, 2648
Donaldsonville, La., waterway to the Rio Grande, Tex., examination and survey ..... I, 451
Dredge and snag boats above Missouri River, operation of ..... I, 490; II, 1555
Dredge and snag boats below Missouri River, operation of ..... I, 486; II, 1535
Fort Snelling, Minn., bridge to St. Paul ..... I, 861; III, 2475
Gauging, including tributaries ..... I, 510, 812; II, 1593; III, 2610, 2648
Grande, Rio, Tex., waterway to Donaldsonville, La., examination and survey ..... I, 451
Grand Rapids to Brainerd, Minn., improvement from ..... I, 499; II, 1581
Gulf of Mexico to St. Louis, Mo., and thence to Lockport (Chicago), Ill. *See* St. Louis, *infra*.
Head of Passes to Cape Girardeau, Mo., levees ..... I, 813; III, 2605
Head of Passes to headwaters, surveys from ..... I, 812; III, 2605
Head of Passes to Ohio River, improvement, surveys, etc ..... I, 812; III, 2605
Illinois and Mississippi Canal, Ill. *See* Illinois and Mississippi Canal.
Illinois River, survey for 14-foot waterway from Lockport (Chicago), Ill., to St. Louis, Mo., and thence to mouth of the Mississippi, including report on water power and land drainage ..... I, 634, 812; III, 1933, 2657
Keokuk (Des Moines Rapids) Canal and dry dock, operating and care ..... I, 494; II, 1568
Levees, Head of Passes to Cape Girardeau, Mo ..... I, 813; III, 2605
Lockport (Chicago), Ill., to St. Louis, Mo., and thence to the Gulf. *See* St. Louis, *infra*.
Loutre, Pass a, La., closing crevasse in ..... I, 396; II, 1399
Mermentau River, La., examination, etc., for waterway to (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Mexico, Gulf of, to St. Louis, Mo., and thence to Lockport (Chicago), Ill. *See* St. Louis, *infra*.
Michigan Lake to St. Louis, Mo., and thence to the Gulf. *See* St. Louis, *infra*.

Mississippi River—Continued.
Minneapolis, Minn., to St. Paul, improvement from ..... I, 497; II, 1578
Minneapolis, Minn., to St. Paul, use by United States of water flowing over dams ..... I, 498
Missouri River, above, operation of snag and dredge boats ..... I, 490; II, 1555
Missouri River, below, removal of snags and wrecks ..... I, 486; II, 1535
Missouri River to Ohio River, improvement from ..... I, 487; II, 1539
Missouri River to St. Paul, Minn., examination and survey for 6-foot depth ..... I, 496
Missouri River to St. Paul, Minn., improvement from ..... I, 491; II, 1559
Moline Harbor, Ill., harbor lines ..... I, 815
Moline Harbor, Ill., improvement of ..... I, 495; II, 1570
Mouth to St. Louis, Mo., and thence to Lockport (Chicago), Ill. *See* St. Louis, *infra*.
Mouths. *See* Head of Passes, *supra*, *and* Passes, *infra*.
Muscatine, Iowa, harbor lines ..... I, 815
New Orleans, La., defenses of ..... I, 5, 9
Ohio River to Head of Passes, improvement, surveys, etc ..... I, 812; III, 2605
Ohio River to Missouri River, improvement from ..... I, 487; II, 1539
Pass a Loutre, La., closing crevasse in ..... I, 396; II, 1399
Plaquemine Bayou, La., construction of lock ..... I, 404; II, 1419
Pokegama Falls, Minn., construction of reservoir dam ..... I, 499; II, 1581
Pokegama Falls, Minn., operating and care of reservoir dam ..... I, 502; II, 1584
Reservoir dams at headwaters, construction of ..... I, 499; II, 1581
Reservoir dams at headwaters, operating and care ..... I, 502; II, 1584
Rio Grande River, Tex., waterway to Donaldsonville, La., examination and survey ..... I, 451
Rock Island Rapids, Iowa, water-power canal, etc ..... I, 830
Royalton, Minn., bridge at ..... I, 819
St. Louis, Mo., survey for 14-foot waterway from Lockport (Chicago), Ill., to, and thence to the Gulf, including report on water power and land drainage ..... I, 634, 812; III, 1933, 2657
St. Paul, Minn., bridge to Fort Snelling ..... I, 861; III, 2475
St. Paul, Minn., gauging ..... I, 510; II, 1593
St. Paul, Minn., to Minneapolis, improvement from ..... I, 497; II, 1578
St. Paul, Minn., to Minneapolis, use by United States of water flowing over dams ..... I, 498
St. Paul, Minn., to Missouri River, examination and survey for 6-foot depth ..... I, 496
St. Paul, Minn., to Missouri River, improvement from ..... I, 491; II, 1559
Sauk Rapids, Minn., dam at ..... I, 830
Snag and dredge boats above Missouri River, operation of ..... I, 490; II, 1555
Snags and wrecks below Missouri River, removal of ..... I, 486; II, 1535
Snelling, Fort, Minn., bridge to St. Paul ..... I, 861; III, 2475
South Pass, examinations and surveys ..... I, 399; II, 1412
South Pass, maintenance of channel ..... I, 400; II, 1413
Southwest Pass, improvement of ..... I, 396; II, 1400
Vicksburg Harbor, Miss., improvement of ..... I, 467; II, 1507
Water-level observations, including tributaries. I, 510, 812; II, 1593; III, 2610, 2648
Wrecks, etc., above Missouri River, removal of ..... I, 499; II, 1555
Wrecks, etc., below Missouri River, removal of ..... I, 486; II, 1535
Mississippi River Commission:
Improvement of Mississippi River ..... I, 812; III, 2605
Levees, Head of Passes to Cape Girardeau, Mo ..... I, 813; III, 2605
Survey for waterway from Lockport, Ill., to St. Louis, Mo ..... I, 634, 812; III, 1933, 2657
Mississippi Sound, Miss.:
Examination and survey of Gulfport anchorage basin, thence to Ship Island anchorage, and of Ship Island Pass ..... I, 395
Improvement of Gulfport-Ship Island Harbor channel, and Ship Island Pass ..... I, 390; II, 1392
Improvement of Horn Island Harbor (*see* Pascagoula River) ..... I, 383; II, 1385
Improvement of Horn Island Pass ..... I, 388; II, 1390
Mississippi, State of, construction of dredge for harbors on coast of ..... I, 394
Missouri River:
Bridge at Kansas City, Mo ..... I, 818
Bridge at Pierre, S. Dak ..... I, 816

Missouri River—Continued.
Bridge between Walworth and Dewey counties, S. Dak ..... I, 817
Dam in vicinity of Buck Rapids, Mont ..... I, 829
Improvement of ..... I, 511; II, 1595
Mobile and Ohio Railroad Company, bridge of ..... I, 821
Mobile Bay and Harbor, Ala.:
Bridge from Cedar Point to Dauphin Island ..... I, 818
Defenses of ..... I, 5, 9
Improvement of ..... I, 369; II, 1365
Improvement of bar at entrance to bay ..... I, 372; II, 1370
Removal of sunken dry dock at Mobile ..... I, 394; II, 1397
Mobile Railway and Dock Company, bridge of ..... I, 818
Moccasin River (Contentnia Creek), N. C.:
Bridge at Hookerton ..... I, 827
Improvement of ..... I, 267; II, 1226
Mokelumne River, Cal., improvement of ..... I, 745; III, 2146
Moline Harbor, Ill.:
Harbor lines in Mississippi River ..... I, 815
Improvement of ..... I, 495; II, 1570
Improvement of Mississippi River between Missouri River and St. Paul ..... I, 491; II, 1559
Monongahela, Pa., bridge across Monongahela River ..... I, 828
Monongahela Connecting Railroad Company, bridge of ..... I, 819
Monongahela River, W. Va. and Pa.:
Bridge at Monongahela, Pa ..... I, 828
Bridge at Pittsburg, Pa ..... I, 819
Harbor lines above Lock 1, between Elizabeth and Lock 4, and between Lock 4 and Brownsville, Pa ..... I, 815
Improvement of, between Morgantown and Fairmont, W. Va ..... I, 542; II, 1679
Improvement at Locks 2, 3, 5, and 6 ..... I, 543; II, 1681
Improvement of Pittsburg Harbor ..... I, 554; II, 1731
Operating and care of locks and dams ..... I, 546; II, 1687
Monroe, La.:
See also Ouachita River.
Bridge across Ouachita River ..... I, 820
Monroe, Mich., improvement of harbor ..... I, 678; III, 2001
Monroe Bay, Va., wreck in ..... I, 249; II, 1199
Monroe Lake, St. Johns River, Fla. (*see* Volusia bar) ..... I, 330; II, 1310
Montana (barge), wreck of ..... I, 94, 954
Montauk light, N. Y., wreck off ..... I, 117, 982
Monuments, statues, etc. *See* Statues, memorials, etc.
Moore, James A., construction of Puget Sound-Lake Washington Canal by ..... I, 791, 793; III, 2221
Mooringsport, La. *See* Cypress Bayou.
Morgan Canal, Tex., operating and care ..... I, 436; II, 1464
Morgan's Louisiana and Texas Railroad and Steamship Company, bridges of ..... I, 821
Mormon Channel, San Joaquin River, Cal., improvement of ..... I, 744; III, 2146
Mortar batteries. *See* Fortifications.
Mosquito Creek Canal, S. C. (*see* Santee River) ..... I, 297; II, 1260
Mount Carmel, Ill.:
See also Wabash River.
Bridge across Wabash River ..... I, 818
Mount Desert, Bar Harbor, Me., construction of breakwater ..... I, 23, 879
Mount Holly Branch, Rancocas River, N. J., improvement of ..... I, 185; II, 1107
Mount Hope Bay, Mass. (*see* Fall River Harbor) ..... I, 86, 944
Mount Rainier National Park, Wash., construction of road ..... I, 857; III, 2471
Mud Lake, La. (*see* Mermentau River) ..... I, 417; II, 1439
Mud River, Ga., improvement of waterway via ..... I, 322; II, 1295
Mud River, S. C. (*see* Savannah-Beaufort waterway) ..... I, 305; II, 1271
Munfordville, Ky., bridge across Green River ..... I, 822
Munfordville Bridge Company, bridge of ..... I, 822
Murderkill River, Del., improvement of ..... I, 199; II, 1125
Muscatine, Iowa:
Harbor lines in Mississippi River ..... I, 815
Improvement of Mississippi River between Missouri River and St. Paul ..... I, 491; II, 1559

Muscle Shoals Canal, Tennessee River, Ala.:
Construction of ..... I, 528; II, 1627
Operating and care ..... I, 531; II, 1639
Muskegon Harbor, Mich., improvement of ..... I, 652; III, 1967
Muskingum River, Ohio:
Improvement of ..... I, 564; II, 1757
Operating and care of locks and dams ..... I, 565; II, 1759
Mystic River, Mass.:
Dam near Cradock Bridge, Medford ..... I, 829
Improvement of ..... I, 53, 907
Improvement of, below mouth of Island End River ..... I, 55, 908

N.

Nansemond County, Va., bridge of ..... I, 823
Nansemond River, Va., improvement of ..... I, 254; II, 1206
Nanticoke River, Del. and Md., improvement of ..... I, 225; II, 1157
Nantucket Harbor, Mass., construction of harbor of refuge ..... I, 75, 931
Nantucket Sound, Mass., wreck off Herring River ..... I, 94, 953
Napa River, Cal., improvement of ..... I, 746; III, 2148
Narragansett Bay, R. I.:
Defenses of ..... I, 5
Improvement of ..... I, 84, 942
Narraguagus River, Me., improvement of ..... I, 22, 878
Narrows of Lake Champlain, N. Y. and Vt., improvement ..... I, 73, 926
Nasel River, Wash. (*see* Willapa River) ..... I, 780; III, 2209
Nashville, Tenn.:
See also Cumberland River.
Bridges across Cumberland River ..... I, 819
Wrecks in Cumberland River ..... I, 525; II, 1620
Natalbany River, La. (*see* Tickfaw River) ..... I, 412; II, 1434
Natchez, Bay, La. *See* Plaquemine Bayou.
National Coast Defense Board ..... I, 5
National parks. *See* Parks.
Navesink (North Branch of Shrewsbury) River, N. J., improvement of. I, 171; II, 1073
Navigable waters. *See* Bridges, Rivers and harbors, *and* Wrecks.
Navigation, Congresses of, Permanent International Commission ..... I, 814
Neches River, Tex.:
Improvement of ..... I, 421; II, 1443
Removal of water hyacinths ..... I, 427; II, 1450
Neebish channels, St Marys River, Mich., improvement of .... I, 691; III, 2036, 2059
Neenah (Fox) River, Wis. *See* Fox River.
Neponset River, Mass.:
Examination and survey ..... I, 74
Improvement of ..... I, 62, 918
Neuse River, N. C.:
Bridge near Maple Cypress ..... I, 822
Improvement of ..... I, 268; II, 1228
Improvement of waterway between Newbern and Beaufort ..... I, 272; II, 1232
Newark Bay, N. Y. and N. J.:
Examination and survey for channel from Kill van Kull north of Shooters Island to near Corner Stake light, including reef at Bergen Point light ..... I, 175
Examination and survey from Staten Island Sound (Arthur Kill) to Passaic River ..... I, 175
Improvement of (*see* Passaic River *and* Arthur Kill) ... I, 154, 157; II, 1042, 1048
Newark Slough, San Francisco Bay, Cal., bridge near Potrero (Dumbarton) Point ..... I, 821
New Bedford Harbor, Mass.:
Defenses of ..... I, 5
Examination and survey of ..... I, 94
Improvement of ..... I, 79, 937
Newbern, N. C.:
Improvement of Neuse River ..... I, 268; II, 1228
Improvement of Trent River ..... I, 270; II, 1229
Improvement of waterway to Beaufort, N. C ..... I, 272; II, 1232
Newburyport Harbor, Mass., improvement of ..... I, 44, 899
New Castle, Del., wreck at ..... I, 185; II, 1104

New Hamburg, N. Y., bridge across Wappinger Creek ..... I, 825
New Haven Harbor, Conn.:
Bridge across West River to West Haven ..... I, 823
Construction of breakwaters ..... I, 103, 966
Improvement of, by dredging, etc ..... I, 102, 964
Improvement of West River ..... I, 105, 967
New Jersey-Staten Island channel:
Examination for channel from Kill van Kull north of Shooters Island to near Corner Stake light, including reef at Bergen Point light ..... I, 175
Improvement of ..... I, 157, 158; II, 1048
Wreck in Kill van Kull ..... I, 174; II, 1077
New London Harbor, Conn.:
Bridge (city) across Winthrop Cove ..... I, 823
Bridge (railroad) across Winthrop Cove ..... I, 824
Examination of ..... I, 117
Improvement of ..... I, 96, 956
New Mill Creek, Va., bridge across ..... I, 820
New Orleans, battle of, monument to the memory of soldiers who fell in ..... I, 862
New Orleans Harbor, La., defenses of ..... I, 5, 9
New Orleans (steamer), wreck of ..... I, 698; III, 2058
Newport Harbor, R. I.:
Examination and survey ..... I, 94
Improvement of ..... I, 87, 945
Newport River, N. C.:
Improvement of Beaufort Harbor ..... I, 273; II, 1233
Improvement of waterway between Beaufort and New River ..... I, 277, 279; II, 1236
Improvement of waterway between Newbern and Beaufort ..... I, 272; II, 1232
New River, N. C.:
Improvement of ..... I, 276; II, 1236
Improvement of waterway to Beaufort ..... I, 277, 279; II, 1236
Improvement of waterway to Swansboro ..... I, 277, 279; II, 1236
New Rochelle, N. Y. (*see* Echo Bay Harbor) ..... I, 121, 148; II, 987
New Shoreham, Block Island, R. I. *See* Block Island.
Newton, Ala.:
See also Choctawhatchee River.
Dam across Choctawhatchee River near ..... I, 830
Newtown Creek, N. Y.:
Improvement of ..... I, 134; II, 1002
Wreck in ..... I, 147; II, 1022
New Whatcom (Bellingham) Harbor, Wash.:
Harbor lines in I and J streets waterway ..... I, 815
Improvement of Whatcom Creek waterway ..... I, 797; III, 2225
New York and Greenwood Lake Railway Company, bridge of ..... I, 827
New York Bay, City, and Harbor, N. Y.:
See also Coney Island channel *and* Creek.
Ambrose channel, improvement of, including dredge construction ..... I, 148; II, 1025, 1106
Arthur Kill, improvement of ..... I, 157, 158; II, 1048
Atlantic Highlands, N. J., examination for breakwater ..... I, 175
Battery, the, removal of shoal in Hudson River off Pier A ..... I, 150; II, 1025
Battery, the, wreck in East River ..... I, 145; II, 1019
Bay Ridge channel, improvement of ..... I, 151; II, 1034
Bayside channel, improvement of ..... I, 148; II, 1025
Bedloe (Liberty) Island. *See* Liberty Island, *infra*.
Bergen Point light, N. J., examination and survey of reef at ..... I, 175
Bronx River, improvement of ..... I, 122; II, 988
Brooklyn, harbor lines at Red Hook ..... I, 814
Defenses of ..... I, 5
Dredges, construction of ..... I, 148; II, 1025, 1106
East (Ambrose) channel, improvement of, including dredge construction ..... I, 148; II, 1025, 1106
East Chester Creek, improvement of ..... I, 123; II, 989
East River, harbor lines ..... I, 814
East River, improvement of ..... I, 131; II, 999
East River, wrecks in ..... I, 145, 146, 147; II, 1019, 1020, 1023
Flushing Bay, improvement of ..... I, 128; II, 995
Gedney channel, improvement of ..... I, 148; II, 1025
Governors Island, enlargement of ..... I, 153; II, 1037

New York Bay, City, and Harbor, N. Y.—Continued.
Gowanus Bay, improvement of ..... I, 151; II, 1034
Gravesend Bay, harbor lines ..... I, 814
Harlem River, improvement of ..... I, 133; II, 1001
Harlem River, wreck in ..... I, 146; II, 1021
Hell Gate, East River, improvement of ..... I, 131; II, 999
Hudson (North) River, removal of reef off Pier A ..... I, 150; II, 1025
Hudson River, wrecks in ..... I, 145, 146; II, 1019, 1022
Hutchinson River (East Chester Creek). *See* East Chester Creek, *supra*.
Improvement of, including dredge construction ..... I, 148; II, 1025
Kill van Kull, examination to vicinity of Liberty (Bedloe) Island west of Robbins reef light-house ..... I, 175
Kill van Kull, examination and survey for channel north of Shooters Island to channel near Corner Stake light, including reef at Bergen Point light ..... I, 175
Kill van Kull, improvement of Staten Island-New Jersey channel ..... I, 157, 158; II, 1048
Kill van Kull, wreck in ..... I, 174; II, 1077
Liberty (Bedloe) Island, vicinity of, west of Robbins reef light-house, to Kill van Kull, examination of ..... I, 175
Lemon Creek (*see* Staten Island-New Jersey channel) ..... I, 158; II, 1050
Lower bay, harbor lines at St. George ferry terminal, Staten Island ..... I, 814
Lower bay, wreck in ..... I, 154; II, 1040
Main Ship channel, improvement of ..... I, 148; II, 1025
Narrows to the sea, improvement from, including dredge construction ..... I, 148; II, 1025, 1106
Newark Bay, examination for channel from Kill van Kull north of Shooters Island to near Corner Stake light, including reef at Bergen Point light ..... I, 175
Newark Bay, improvement of (*see* Passaic River *and* Arthur Kill) ..... I, 154, 157; II, 1042, 1048
New Jersey-Staten Island channel. *See* Staten Island-New Jersey channel, *infra*.
Newtown Creek, improvement of ..... I, 134; II, 1002
Newtown Creek, wreck in ..... I, 147; II, 1022
North (Hudson) River. *See* Hudson River, *supra*.
Pugleys Creek, wreck at entrance ..... I, 147; II, 1023
Red Hook, Brooklyn, harbor lines ..... I, 814
Red Hook channel, improvement of ..... I, 151; II, 1034
St. George ferry terminal, Staten Island, harbor lines ..... I, 814
Sandy Hook Bay, N. J., examination for breakwater at Atlantic Highlands. I, 175
Shooters Island, Newark Bay, examination and survey for channel north of ..... I, 175
Spuyten Duyvil Creek (*see* Harlem River) ..... I, 133; II, 1001
Staten Island, harbor lines at St. George ferry terminal ..... I, 814
Staten Island, improvement of Lemon Creek ..... I, 158; II, 1050
Staten Island-New Jersey channel, examination and survey for channel from Kill van Kull north of Shooters Island to near Corner Stake light, including reef at Bergen Point light ..... I, 175
Staten Island-New Jersey channel, improvement of ..... I, 157, 158; II, 1048
Staten Island-New Jersey channel, wreck in Kill van Kull ..... I, 174; II, 1077
Staten Island Sound. *See* Arthur Kill, *supra*.
Supervision of ..... I, 808; III, 2245
Wrecks in ..... I, 145, 146, 147, 154; II, 1019, 1020, 1021, 1022, 1040, 1077
New York Central and Hudson River Railroad Company:
Bridge across Doodletown Bight, or Creek, N. Y ..... I, 824
Bridges across Wappinger Creek, N. Y ..... I, 825, 828
New York, New Haven and Hartford Railroad Company:
Bridges across Niantic, West, and Duck rivers, Conn ..... I, 823
Bridge across Winthrop Cove, New London, Conn ..... I, 824
New York, Susquehanna and Western Railroad Company, bridge of ..... I, 829
Niagara Falls, Niagara River, N. Y. *See* Niagara River.
Niagara River, N. Y.:
Black Rock Harbor and channel, improvement of ..... I, 724; III, 2110
Buffalo Harbor, improvement of ..... I, 720; III, 2103
Control and regulation of waters of, and preservation of the falls.. I, 854; III, 2457
Discharge of ..... I, 853; III, 2457

Niagara River—Continued.
Erie Basin and Black Rock Harbor, improvement of Buffalo entrance... I, 723; III, 2110
Erie Basin and Black Rock Harbor, improvement of Lake Erie entrance. I, 722; III, 2108
North Tonawanda to Lake Erie, including Tonawanda Harbor, improvement from ..... I, 725; III, 2112
Surveys, etc. (*see* Northern and Northwestern Lakes) ..... I, 842; III, 2443, 2459
Wreck of steamer *Embury*, near Grand Island, removal of..... I, 725; III, 2112
Niantic River, Conn., bridge at East Lyme ..... I, 823
Nobska light-house, Mass., wreck off ..... I, 94, 954
Nolin River, Ky., improvement of (*see* Green River) ..... I, 580; II, 1809
Nomini Creek, Va., improvement of ..... I, 240; II, 1181
Nooksak River, Wash., improvement of (*see* Puget Sound) ..... I, 785; III, 2214
Norfolk and Southern Railroad Company:
Bridges across Albemarle Sound, and Johnson and Mackeys Creeks, N. C.. I, 824
Bridge across Pungo River, N. C ..... I, 821
Norfolk and Western Railroad Company, bridge of ..... I, 819
Norfolk Harbor, Va.:
Examination and survey for waterway to Beaufort Inlet ..... I, 263
Harbor lines in Paradise Creek ..... I, 815
Improvement of, and its approaches, including Hospital Point .. I, 250; II, 1201
Improvement of waterway to Albemarle Sound, via Currituck Sound .... I, 258; II, 1213
Improvement of waterway to sounds of North Carolina (to Pamlico Sound), via Pasquotank River ..... I, 258; II, 1212
Improvement of Western Branch, Elizabeth River ..... I, 252; II, 1204
Jamestown Exposition grounds, pier construction and dredging .. I, 247; II, 1195
Wrecks in ..... I, 262, 263; II, 1219
Norfolk-on-the-Roads (steamer), wreck of ..... I, 262; II, 1219
Northampton and Halifax Bridge Company, bridge of ..... I, 816
North Branch, Chicago River, Ill. *See* Chicago Harbor and River.
North Branch, Shrewsbury River, N. J., improvement of ..... I, 171; II, 1073
North Carolina Cut, N. C., improvement of waterway via ..... I, 258; II, 1213
North Carolina, State of:
Examination and survey for waterway from Norfolk, Va., to Beaufort Inlet ..... I, 263
Improvement of waterways from Norfolk, Va., to sounds of. I, 258; II, 1212, 1213
Northeast River, N. C., improvement of ..... I, 280; II, 1240
Northern and Northwestern Lakes:
Bulletins ..... I, 854; III, 2454
Channels in waters connecting, examination and survey ..... I, 698
Channels in waters connecting, improvement of ..... I, 685; III, 2007, 2059
Commercial statistics, Sault Ste. Marie canals, Mich ..... I, 690; III, 2016, 2059
Connecting waters between Lakes Superior and Huron, supplemental survey report, with estimate, etc., in re new lock at St. Marys Falls Canal, Mich ..... I, 698
Control and regulation of waters of Niagara River, and preservation of Niagara Falls ..... I, 854; III, 2457
Discharges, table of (1860 to 1906) ..... I, 853; III, 2457
Navigation of, in 1841, conditions governing ..... I, 843
Project for future work of the Lake Survey ..... I, 850
Surveys and charts ..... I, 842, 848, 852, 853; III, 2443, 2459
Water levels ..... I, 854; III, 2455, 2456
Water levels on east shore of Lake Michigan, variations in ..... I, 640
Northern Electric Company, bridge of ..... I, 827
Northern Pacific Railway Company, bridges of ..... I, 824, 826
North Fork, Forked Deer River, Tenn. *See* Forked Deer River.
North Fork, Skagit River, Wash. (*see* Puget Sound) ..... I, 785; III, 2214
North Fork, Holston River, Tenn., bridge near Kingsport ..... I, 817
North Fork, Kentucky River, Ky., bridge at Beattyville ..... I, 821
North Hero Island channel (The Gut), Lake Champlain, Vt.:
Bridge across ..... I, 828
Improvement of ..... I, 71
North Landing River, Va. and N. C., improvement of waterway via. I, 258; II, 1213
North (Hudson) River, N. Y. *See* New York City and Harbor.
North River, N. C., improvement of waterway via ..... I, 258; II, 1213

North River, Wash. (*see* Willapa River) ..... I, 780; III, 2209
North Tonawanda, N. Y. (*see* Tonawanda Harbor) ..... I, 725; III, 2112
Norwalk Harbor, Conn.:
Examination and survey, including East and South Norwalk harbors .... I, 118
Improvement of ..... I, 111, 975
Notter, Geo. H. (canal boat), wreck of ..... I, 174; II, 1077
Novato Creek, Cal., bridge across ..... I, 820

O.

Oak Harbor, Wash., improvement of (*see* Puget Sound) ..... I, 785; III, 2214
Oakland Harbor, Cal., improvement of ..... I, 740; III, 2141
Oakmont, Pa., bridge across Allegheny River ..... I, 819
Obion River, Tenn., improvement of ..... I, 516; II, 1607
Occoquan Creek, Va., improvement of ..... I, 238; II, 1177
Ocean City, Md., bridge across Sinepuxent Bay ..... I, 825
Ocean City, N. J., bridge across Great Egg Bay ..... I, 823
Ocklawaha (Oklawaha) River, Fla. *See* Oklawaha River.
Ocmulgee River, Ga., improvement of ..... I, 317; II, 1289
Oconee River, Ga.:
Examinations and surveys ..... I, 327
Improvement of ..... I, 315; II, 1287
Oconto Harbor, Wis., improvement of ..... I, 607; III, 1871
Office of the Chief of Engineers, officers on duty in ..... I, 862
Officers, engineer, civilian assistants to ..... I, 19
Officers of the Corps of Engineers. *See* Corps of Engineers.
Ogdensburg Harbor, N. Y.:
Improvement of ..... I, 732; III, 2127
Wreck in ..... I, 733; III, 2129
Ohio River:
Bridge across Back River channel at Wheeling Island, W. Va ..... I, 816
Bridge between Bellaire, Ohio, and Benwood, W. Va ..... I, 819
Bridge between Parkersburg, W. Va., and Belpre, Ohio, construction of .. I, 818
Bridge between Parkersburg, W. Va., and Belpre, Ohio, obstructing navigation ..... I, 828
Cairo, Ill., to mouth of Green River, Ky., examination and survey for increasing depth by dredging ..... I, 541
Davis Island dam, Pa., operating and care ..... I, 553; II, 1727
Falls at Louisville, Ky., improvement of ..... I, 570; II, 1795
Gauging (*see* Mississippi River Commission) ..... I, 812; III, 2610, 2648
General improvement ..... I, 536; II, 1653
Ice piers ..... I, 536; II, 1653
Indiana chute, Louisville, Ky., improvement of ..... I, 570; II, 1795
Locks and dams, examination and survey for 6 and 9 foot depths ..... I, 541
Locks and Dams 1, 2, and 6, operating and care ..... I, 553; II, 1727
Locks and Dams 2–7, construction of ..... I, 550; II, 1706
Locks and Dams 8, 11, 13, 18, 19, 26, construction of ..... I, 556; II, 1735
Lock and Dam 37, construction of ..... I, 539; II, 1670
Louisville and Portland Canal, Ky., enlargement of ..... I, 570; II, 1795
Louisville and Portland Canal, Ky., operating and care ..... I, 575; II, 1800
Pittsburg Harbor, Pa., harbor lines ..... I, 815
Pittsburg Harbor, Pa., improvement of ..... I, 554; II, 1731
Pools 3, 4, and 6, dredging in ..... I, 552; II, 1725
Snag boat, operation of ..... I, 540, 553; II, 1675, 1726
Okanogan River, Wash., improvement of ..... I, 798; III, 2227
Okaw (Kaskaskia) River, Ill., bridge near Baldwin ..... I, 821
Oklawaha River, Fla., improvement of ..... I, 331; II, 1312
Old South River, N. J. *See* South River.
Old Tampa Bay, Fla. (*see* Tampa Bay) ..... I, 340; II, 1324
Olequa, Wash., bridge across Cowlitz River ..... I, 827
Olympia Harbor, Wash., improvement of ..... I, 788; III, 2218
Ontario Lake:
See also Northern and Northwestern Lakes.
Water levels and discharges ..... I, 853, 854; III, 2455, 2456, 2457
Ontonagon Harbor, Mich., improvement of ..... I, 595; II, 1850
Oostenaula River, Ga., improvement of ..... I, 366, 368; II, 1362
Orange Mills flats, St. Johns River, Fla., improvement at ..... I, 329; II, 1309

Orange River, Fla., improvement of ..... I, 336; II, 1318
Orbin, George, Bridge Company, bridge of ..... I, 827
Ordnance. *See* Fortifications.
Oregon and Washington Railroad Company:
Bridges across Lake, Cowlitz, and Lewis rivers, Wash ..... I, 827
Bridge across Puyallup River, Wash ..... I, 824
Oregon, dredging plant for harbors on coast ..... I, 758; III, 2168
Oregon Electric Railway Company, bridge of ..... I, 821
Oregon Slough, Columbia River, bridge at Vancouver, Wash ..... I, 817
Oriental, N. C.:
Bridge across Smith Creek ..... I, 824
Wreck near ..... I, 288
Osage River, Mo., improvement of ..... I, 514; II, 1601
Oswegatchie River, N. Y. (*see* Ogdensburg Harbor) ..... I, 732; III, 2127
Oswego, N. Y., improvement of harbor ..... I, 729; III, 2123
Oswego, Oreg., bridge across Willamette River ..... I, 826
Ottertail Lake and River, Minn., survey of ..... I, 509; II, 1593
Ouachita River, Ark. and La.:
Bridge at Monroe, La ..... I, 820
Improvement of ..... I, 461; II, 1497
Overpeck Creek, N. J., bridge at Ridgefield Park ..... I, 829
Oyster Creek, Tex., improvement of ..... I, 436

P.

Pacific County, Wash.:
Bridge across Ellis Slough ..... I, 826
Bridge across Wilson Creek ..... I, 828
Pagan River, Va., improvement of ..... I, 254; II, 1207
Painesville, Ohio, bridge across Grand River ..... I, 824
Pamlico River, N. C.:
Examination and survey ..... I, 288
Improvement of ..... I, 265; II, 1224
Pamlico Sound, N. C.:
Examination and survey of waterway to Beaufort Inlet (*see* Norfolk-Beaufort Inlet waterway) ..... I, 263
Improvement of waterway to Beaufort Inlet ..... I, 271; II, 1231
Improvement of waterway to Norfolk, Va ..... I, 258; II, 1212
Pamunkey River, Va., improvement of ..... I, 237; II, 1176
Paradise Creek, Norfolk, Va., harbor lines ..... I, 815
Parkersburg, W. Va.:
See also Ohio River.
Bridge across Little Kanawha River ..... I, 826
Bridge across Ohio River to Belpre, Ohio, construction of ..... I, 818
Bridge across Ohio River to Belpre, Ohio, obstructing navigation ..... I, 828
Parkersburg and Ohio Bridge Company, bridge of ..... I, 818
Parkersburg and South Side Bridge Company, bridge of ..... I, 826
Parkersburg Branch Railroad Company, bridge of ..... I, 828
Parks, public:
District of Columbia, improvement and care ..... I, 841; III, 2299
Gettysburg National Park, Pa., tablet to Abraham Lincoln ..... I, 841; III, 2299
Mount Rainier National Park, Wash., construction of road ..... I, 857; III, 2471
Yellowstone National Park, improvement of ..... I, 856; III, 2461
Pascagoula River, Miss.:
Improvement above Dog River ..... I, 385; II, 1387
Improvement below Dog River ..... I, 383; II, 1385
Improvement below Dog River, diversion of funds to construction of dredge for coast harbors ..... I, 394
Pasquotank River, N. C., improvement of waterway via ..... I, 258; II, 1212
Passaic, N. J. *See* Passaic River.
Passaic River, N. J.:
Bridge between Passaic and East Passaic ..... I, 820
Examination and survey from Newark Bay to Montclair and Greenwood Lake Railroad bridge ..... I, 175
Harbor lines near Harrison ..... I, 815
Improvement of ..... I, 154; II, 1042
Pass a Loutre, Mississippi River, La., closing crevasse in ..... I, 396; II, 1399

Pass Cavallo, Tex.:
Examination, etc., of channel to Aransas Pass (*see* Rio Grande-Mississippi River waterway) ..... I, 451
Improvement of channel to Aransas Pass ..... I, 443, 444; II, 1472
Patapsco River, Md.:
Improvement of, and channel to Baltimore ..... I, 206, II, 1137
Improvement of channel to Curtis Bay ..... I, 210; II, 1141
Improvement of harbor at southwest Baltimore (Spring Garden) ..... I, 211; II, 1142
Patchogue River, N. Y., improvement of (*see* Great South Bay) ..... I, 136; II, 1005
Paterson (ferryboat), wreck of ..... I, 146; II, 1022
Pawcatuck River, R. I. and Conn., improvement of ..... I, 95, 955
Pawpaw River, Mich. (*see* St. Joseph Harbor) ..... I, 640; III, 1947
Pawtucket (Seekonk) River, R. I., improvement of ..... I, 83, 949
Peace Creek, or River, Fla. (*see* Charlotte Harbor) ..... I, 387; II, 1319
Pearl Harbor, Hawaii, defenses of ..... I, 11, 12, 15
Pearl River, Miss.:
Examination and survey from Edinburg to Lake Burnside ..... I, 395
Examination and survey from mouth to Rockport ..... I, 395
Improvement between Edinburg and Jackson ..... I, 393; II, 1396
Improvement below Rockport, including East Pearl River ..... I, 392; II, 1395
Peconic and Shinnecock Canal, N. Y., bridge across ..... I, 828
Pedee rivers, S. C.:
Improvement of Great Pedee ..... I, 293; II, 1256
Improvement of Little Pedee ..... I, 290; II, 1255
Peekskill Harbor, N. Y., improvement of ..... I, 141; II, 1014
Pemberton (barge), wreck of ..... I, 94, 954
Pend Oreille River, Idaho and Wash., improvement of ..... I, 799; III, 2228
Penobscot River, Me.:
Examination and survey of South Branch at Frankfort ..... I, 43
Improvement of ..... I, 26, 883
Improvement of Bucksport Harbor ..... I, 27, 884
Pensacola Harbor, Fla.:
Defenses of ..... I, 5, 9
Improvement of, including dredge construction ..... I, 361; II, 1104, 1352
Pentwater Harbor, Mich.:
Examination of ..... I, 667
Improvement of ..... I, 655; III, 1970
Peoria Harbor and Lake, Ill.:
See also Illinois River.
Construction of lower free wagon bridge across Illinois River ..... I, 821
Harbor lines ..... I, 815
Pequonnock (Poquonock) River, Conn. (*see* Bridgeport Harbor) ..... I, 108, 972
Pere Marquette Lake, Mich.:
Bridge at Ludington ..... I, 828
Improvement of Ludington Harbor ..... I, 657; III, 1974
Peri (sloop), wreck of ..... I, 635; III, 1934
Permanent International Commission of Congresses of Navigation ..... I, 814
Permits:
For construction of bridges ..... I, 816, 819
For diversion of water from Niagara River, N. Y., and for transmission of electrical power from Canada ..... I, 854, 855; III, 2457
For erection in Porto Rico of structures other than bridges ..... I, 816
For erection of structures other than bridges ..... I, 829
Perquimans River, N. C., improvement of ..... I, 260; II, 1215
Perriwig bar, Delaware River:
See also Delaware River.
Improvement of ..... I, 181; II, 1100
Perry County, Miss., bridge of ..... I, 824
Petaluma Creek, Cal., improvement of ..... I, 745; III, 2147
Petersburg, Va., diversion of Appomattox River at ..... I, 256; II, 1209
Petoskey Harbor, Mich., improvement of ..... I, 666; III, 1986
Pharr, J. N., & Sons (Limited), bridge of ..... I, 827
Philadelphia, Pa., improvement of Delaware River at ..... I, 176, 181; II, 1079, 1100
Philippine Islands, defenses of ..... I, 11, 12, 14, 15
Pierhead lines, establishment of ..... I, 814
Pierre, S. Dak.:
Bridge across Missouri River ..... I, 816
Improvement of Missouri River ..... I, 511; II, 1595

Pierre and Fort Pierre Bridge Railway Company, bridge of ..... I, 816
Pierre, Fort, S. Dak. (*see* Missouri River) ..... I, 511; II, 1595
Piers:
Construction of, in connection with Jamestown Exposition, Va..... I, 247, 249; II, 1195, 1198
Permits for construction of..... I, 829
Permits for construction of, in Porto Rico..... I, 816
Pigeon Bayous, La., improvement of ..... I, 404; II, 1419
Pike Creek, Wis., improvement of Kenosha Harbor..... I, 620; III, 1903
Pilot Town range beacon, St. Johns River, Fla., wreck near..... I, 347
Pine Bluff, Ark.:
Bridge across Arkansas River ..... I, 817
Improvement of Arkansas River..... I, 473; II, 1515
Pine Island Sound, Fla. (*see* Charlotte Harbor)..... I, 337; II, 1319
Pine Lake and River (Charlevoix Harbor), Mich., improvement of.. I, 664; III, 1983
Pine River (St. Clair County), Mich., improvement of ..... I, 681; III, 2003
Pine River, Minn.:
Construction of reservoir dam..... I, 499; II, 1581
Operating and care of reservoir dam ..... I, 502; II, 1584
Piscataqua River, N. H., bridge at Dover Point..... I, 827
Pithers Point, Rainy River, Minn., bridge at..... I, 818
Pittsburg Harbor, Pa.:
See also Allegheny, Monongahela, *and* Ohio rivers.
Bridge across Monongahela River ..... I, 819
Harbor lines in Monongahela and Ohio rivers..... I, 815
Improvement of..... I, 554; II, 1731
Pittsburgh, Fort Wayne and Chicago Railway Company, bridge of..... I, 826
Plantation Creek, Ga., improvement of ..... I, 319; II, 1291
Plaquemine, La., bridge across Bayou Plaquemine..... I, 826
Plaquemine Bayou, La.:
Bridge at Plaquemine ..... I, 826
Improvement of..... I, 404; II, 1419
Removal of water hyacinths ..... I, 427; II, 1450
Plymouth Harbor, Mass., improvement of ..... I, 69, 922
Pocomoke River, Md., improvement of ..... I, 221; II, 1153
Poesten Kill, N. Y., wreck at mouth ..... I, 147; II, 1022
Point Judith Harbor and Pond, R. I.:
Construction of harbor of refuge..... I, 89, 947
Improvement of pond entrance..... I, 90, 949
Point Marion, Pa., bridge across Cheat River..... I, 826
Pokegama Falls, Mississippi River, Minn.:
Construction of reservoir dam ..... I, 499; II, 1581
Operating and care of reservoir dam ..... I, 502; II, 1584
Pollock Rip shoals, Mass., wreck on ..... I, 94, 953
Polloksville, N. C.:
See also Trent River.
Bridge across Trent River (county bridge) ..... I, 822
Bridge of John L. Roper Lumber Company across Trent River ..... I, 823
Ponce Harbor, P. R.:
Examination of ..... I, 807
Wreck in ..... I, 807; III, 2240
Ponchatoula River, La. (*see* Tickfaw River) ..... I, 412; II, 1434
Poquonock River, Conn. (*see* Bridgeport Harbor)..... I, 108, 972
Porcupine Island, Bar Harbor, Me., construction of breakwater..... I, 23, 879
Portage Lake and Lake Superior canals, Houghton County, Mich., improvement and care ..... I, 597, 599; II, 1853
Portage Lake, Manistee County, Mich., improvement of harbor of refuge..... I, 661; III, 1979
Portage River, Houghton County, Mich., waterway via..... I, 597, 599; II, 1853
Portage River, Ohio, improvement of Port Clinton Harbor ..... I, 700; III, 2065
Port Arthur Canal, Tex.:
Improvement of..... I, 423; II, 1443
Operating and care ..... I, 424; II, 1445
Port Bolivar, Tex., improvement of channel to ..... I, 433; II, 1460
Port Chester Harbor, N. Y., improvement of ..... I, 118; II, 983
Port Clinton Harbor, Ohio, improvement of ..... I, 700; III, 2065
Port Harford, Cal. (*see* San Luis Obispo Harbor) ..... I, 738; III, 2138

Port Huron, Mich., improvement of Black River at ..... I, 680; III, 2002
Port Jefferson Harbor, N. Y., improvement of ..... I, 124; II, 990
Portland, Ky.:
Enlargement of Louisville and Portland Canal ..... I, 570; II, 1795
Operating and care of Louisville and Portland Canal ..... I, 575; II, 1800
Portland, Me.:
Defenses of ..... I, 5
Improvement of harbor ..... I, 35, 890
Portland and Seattle Railway Company:
Bridge across Columbia Slough of Columbia River at Vancouver, Wash.. I, 824
Bridge across Oregon Slough and Columbia River at Vancouver, Wash ... I, 817
Bridges across Klickitat, Little White Salmon, White Salmon, and Wind rivers, Wash ..... I, 825
Porto Rico:
Defenses of ..... I, 12, 15
Erection of structures in navigable waters of ..... I, 816
Examination of Great Harbor, Culebra Island ..... I, 807
Examination of Mayaguez Harbor ..... I, 807
Examination of Ponce Harbor ..... I, 807
Improvement of San Juan Harbor ..... I, 806; III, 2239
Wreck in Ponce Harbor ..... I, 807; III, 2240
Port Royal (Beaufort) River, S. C., improvement of waterway between Beaufort, S. C., and Savannah (*see* Savannah Harbor) ..... I, 305; II, 1271
Port Royal Sound, S. C., defenses of ..... I, 5
Portsmouth, N. H., defenses at ..... I, 5
Port Tampa, Fla. (*see* Tampa Bay) ..... I, 340; II, 1324
Port Washington Harbor, Wis., improvement of ..... I, 616; III, 1892
Port Wing Harbor, Wis., improvement of ..... I, 592; II, 1845
Position finders, range and. *See* Fortifications.
Potomac Park, Washington, D. C ..... I, 841; III, 2299
Potomac River:
See also Washington, D. C.
Aqueduct Bridge, Washington, D. C., repair of ..... I, 830; III, 2271
Bridge at Shepherdstown, W. Va ..... I, 819
Highway bridge (replacing Long Bridge) at Washington, D. C.. I, 832; III, 2273
Improvement at Washington, D. C ..... I, 229; II, 1163
Improvement below Washington, D. C ..... I, 231; II, 1167
Sea wall between Arsenal wall and N street, Washington, D. C.. I, 841; III, 2299
Potrero (Dumbarton) Point, San Francisco Bay, Cal.:
Bridge across Newark Slough near ..... I, 821
Bridge across San Francisco Bay at ..... I, 823
Poughkeepsie, N. Y., bridge across Hudson River ..... I, 821
Presque Isle, Marquette, Mich., construction of harbor of refuge ..... I, 601; II, 1862
Presque Isle Peninsula, Erie, Pa., improvements at ..... I, 717; III, 2097
Prestonsburg, Ky., bridge across Levisa Fork, Big Sandy River ..... I, 826
Printing Office, Government, Washington, D. C., telegraph line to Capitol and Departments ..... I, 841; III, 2299
Projects. *See* Fortifications *and* Rivers and harbors.
Providence Harbor and River, R. I.:
Improvement of ..... I, 84, 942
Improvement of Pawtucket (Seekonk) River ..... I, 83, 940
Removal of Green Jacket shoal ..... I, 86, 942
Provincetown Harbor, Mass., improvement of ..... I, 70, 923
Public buildings and grounds, District of Columbia ..... I, 841; III, 2299
Public parks. *See* Parks.
Puget Sound, Wash.:
Defenses of ..... I, 5
Improvement of, and tributaries, including dredge construction ..... I, 758, 785; III, 2168, 2214
Improvement of waterway to Lake Washington, by United States and by James A. Moore ..... I, 791, 793; III, 2221
Inspection, etc., of fish traps ..... I, 787; III, 2217
Pugleys Creek, N. Y., wreck at entrance ..... I, 147; II, 1023
Pulaski, General Count, statue of ..... I, 841; III, 2299
Pultneyville Harbor, N. Y., improvement of ..... I, 727; III, 2117
Pungo River, N. C., bridge at Bellhaven ..... I, 821
Punta Gorda, Fla., improvement of Charlotte Harbor ..... I, 337; II, 1319

Puyallup River, Wash.:
Bridges near Tacoma ..... I, 820, 824
Improvement of (*see* Puget Sound) ..... I, 785; III, 2214
Improvement of Tacoma Harbor ..... I, 789; III, 2219

Q.

Quarantine Island, Honolulu Harbor, Hawaii, reclamation of ..... I, 804; III, 2236
Queenstown Harbor, Md., improvement of ..... I, 215; II, 1146
Quinnipiac River, New Haven, Conn., improvement of ..... I, 102, 964

R.

Raccoon Creek, N. J., improvement of ..... I, 189; II, 1112
Racine Harbor, Wis.:
Bridge (city) across Root River ..... I, 827
Improvement of ..... I, 619; III, 1898
Rainier, Mount, National Park, Wash., construction of road ..... I, 857; III, 2471
Rainy River, Minn., bridge at Pithers Point ..... I, 818
Rainy River Bridge Company, bridge of ..... I, 818
Raisin River, Mich. (*see* Monroe Harbor) ..... I, 678; III, 2001
Ranald (steamer), wreck of ..... I, 207; II, 1134
Rancocas River, N. J., improvement of ..... I, 185; II, 1107
Range and position finders. *See* Fortifications.
Rappahannock River, Va., improvement of ..... I, 241; II, 1182
Raritan Bay and River, N. J.:
Improvement of bay ..... I, 162; II, 1054
Improvement of Keyport Harbor ..... I, 163; II, 1056
Improvement of river ..... I, 165; II, 1060
Improvement of Shoal Harbor ..... I, 168; II, 1069
Wreck in bay, near Lorillard ..... I, 174; II, 1076
Raymond, Wash., bridge across Ellis Slough ..... I, 826
Red Hook, Brooklyn, N. Y., harbor lines ..... I, 814
Red Hook channel, New York Harbor, N. Y., improvement of ..... I, 151; II, 1034
Red Lake and Red Lake River, Minn.:
Improvement of (*see* Red River of the North) ..... I, 505; II, 1589
Survey of ..... I, 509; II, 1593
Red River, La., Ark., Tex., and Ind. T.:
Cypress Bayou and lakes to Jefferson, Tex., improvement of ..... I, 455; II, 1489
Gauging (*see* Mississippi River Commission) ..... I, 812; III, 2610, 2648
Improvement above Fulton, Ark ..... I, 456; II, 1490
Improvement below Fulton, Ark ..... I, 458; II, 1493
Rectification of mouth by Mississippi River Commission ..... I, 812; III, 2605
Red River of the North, Minn. and N. Dak.:
Improvement of ..... I, 505; II, 1589
Survey of Otter Tail Lake and River for reservoir dam ..... I, 509; II, 1593
Survey of Red Lake and Red Lake River for reservoir dam ..... I, 509; II, 1593
Regulations and rules:
For navigation of canals ..... I, 815
For opening of drawbridges ..... I, 815
Reservations, public. *See* Parks.
Reservoirs:
Big Stone Lake, Minn., survey for ..... I, 509; II, 1593
Mississippi River, headwaters, construction of ..... I, 499; II, 1581
Mississippi River, headwaters, operating and care ..... I, 502; II, 1584
Otter Tail Lake and River, Minn., survey for ..... I, 509; II, 1593
Red Lake and Red Lake River, Minn., survey for ..... I, 509; II, 1593
Traverse Lake, Minn., survey for ..... I, 509; II, 1593
Washington Aqueduct, D. C ..... I, 836; III, 2283
Resolutions, joint, 59th Congress, 2d session, affecting Corps of Engineers ..... III, 2477
Rices Point, Duluth Harbor, Minn., bridge across St. Louis Bay ..... I, 826
Richmond, H. A. (schooner barge), wreck of ..... I, 635; III, 1934
Richmond Harbor, Va.:
Improvement of (*see* James River) ..... I, 245; II, 1188
Wreck in ..... I, 249; II, 1199
Ridgefield, Wash., bridge across Lake River ..... I, 827
Ridgefield Park, N. J., bridge across Overpeck Creek ..... I, 829
Ridley Creek, Pa., bridge near Chester ..... I, 825

Rio Grande River, Tex., examination and survey for waterway to Mississippi River at Donaldsonville, La. ..... I, 451
Rivers and harbors:
Appropriations for operations during the past year ..... I, 19
Board of Engineers for ..... I, 807; III, 2241
Board of Engineers, The ..... I, 5, 865
Bridges, construction and alteration ..... I, 816, 819, 828
Bridges, regulations for opening of draws ..... I, 815
Engineer divisions ..... I, 20
Estimate of appropriations for ..... I, 20
Examinations and surveys, under act of March 2, 1907 ..... I, 21
Expenditures during the past year ..... I, 19
Harbor lines, establishment of ..... I, 814
Regulations for navigation of canals ..... I, 815
Regulations for opening of drawbridges ..... I, 815
Status of works ..... I, 19
Structures other than bridges, permits for erection of ..... I, 829
Structures other than bridges, permits for erection of, in Porto Rico ..... I, 816
Roads:
In Mount Rainier National Park, Wash ..... I, 857; III, 2471
In Yellowstone National Park ..... I, 856; III, 2461
Roanoke River, N. C.:
Bridge near Weldon ..... I, 816
Improvement of ..... I, 261; II, 1218
Roche Harbor, Wash. (*see* Puget Sound) ..... I, 785, 786; III, 2214
Rockaway Inlet, N. Y.:
Examination and survey from Coney Island channel to Jamaica Bay via. I, 148
Wreck in ..... I, 146; II, 1020
Rockhall Harbor, Md., improvement of ..... I, 214; II, 1145
Rockhaven, N. Dak., ice harbor (*see* Missouri River) ..... I, 511; II, 1595
Rock Hole Creek, Md., bridges across ..... I, 827
Rock Island Rapids, Mississippi River, Iowa:
See also Mississippi River.
Water-power canal, etc., at ..... I, 830
Rock Island (steamer), wreck of ..... I, 802; III, 2232
Rockland Harbor, Me., improvement of ..... I, 29, 885
Rockport, Mass., construction of harbor of refuge in Sandy Bay ..... I, 47, 903
Rock River, Ill.:
Construction of canal around ..... I, 637; III, 1940
Dams at Carrs and Vandruffs islands ..... I, 830
Improvement of pool between Locks 29 and 35, Illinois and Mississippi Canal ..... I, 495; II, 1573
Operating and care of canal around ..... I, 495; II, 1572
Romerly Marsh, Ga., improvement of waterway via ..... I, 322; II, 1295
Rondout Harbor, N. Y., improvement of ..... I, 140; II, 1014
Root River, Wis.:
Bridge at Racine ..... I, 827
Improvement of Racine Harbor ..... I, 619; III, 1898
Roper, John L., Lumber Company, bridge of ..... I, 823
Rouge River, Mich., improvement of ..... I, 676; III, 2000
Rough River, Ky.:
Improvement of ..... I, 582; II, 1820
Operating and care of lock and dam ..... I, 583; II, 1820
Round Lake, Mich., improvement of Charlevoix Harbor ..... I, 664; III, 1983
Royalton, Minn., bridge across Mississippi River ..... I, 819
Rules and regulations. *See* Regulations and rules.
Rutland Railroad Company, bridge of ..... I, 828

S.

Sabine Lake, Pass, and River, Tex.:
Examination and survey for waterway to Donaldsonville, La., and to Brazos River ..... I, 451
Improvement of mouth of river and of channel through lake ..... I, 421; II, 1443
Improvement of Sabine Pass Harbor ..... I, 425; II, 1447
Removal of water hyacinths in river ..... I, 427; II, 1450
Saco River, Me., improvement of ..... I, 37, 892

Sacramento River, Cal.:
Bridge near Chico Landing ..... I, 827
Improvement of ..... I, 749; III, 2153
Improvement of, by California Débris Commission, with report on future operations ..... I, 809; III, 2253, 2262
Sag Harbor, N. Y., improvement at ..... I, 130; II, 998
Saginaw River, Mich., improvement of ..... I, 670; III, 1991
Sagmore (schooner), wreck of ..... I, 94, 954
St. Clair Canal, Lake, and River, Mich.:
Channels in waters connecting the Great Lakes, examination and survey. I, 698
Channels in waters connecting the Great Lakes, improvement of ..... I, 685; III, 2007, 2059
Discharge of river and lake ..... I, 853; III, 2457
Improvement of canal, with special report on second channel ... I, 693; III, 2041
Operating and care of canal ..... I, 694; III, 2047
Surveys, etc. (*see* Northern and Northwestern Lakes) ..... I, 842; III, 2443, 2459
Wrecks in lake and river ..... I, 698; III, 2057
St. Clair, Malvina (canal boat), wreck of ..... I, 146, II, 1020
St. Cloud Electric Power Company, dam of ..... I, 829
St. Croix Lake and River, Wis. and Minn., improvement of ..... I, 503; II, 1587
St. Francis River, Ark.:
Gauging (*see* Mississippi River Commission) ..... I, 812; III, 2610, 2648
Improvement of ..... I, 484; II, 1531
St. George Sound, Fla. *See* Carrabelle Harbor.
St. George, Staten Island, N. Y., harbor lines at ferry terminal ..... I, 814
St. Johns River, Fla.:
Harbor lines at Hogans Creek, Jacksonville ..... I, 815
Improvement at Jacksonville ..... I, 329; II, 1309
Improvement between Jacksonville and the ocean ..... I, 328; II, 1305
Improvement between Jacksonville and Palatka, including Orange Mills flats ..... I, 329; II, 1309
Improvement of Volusia bar, and between Volusia bar and Lake Monroe. I, 330; II, 1310
Removal of water hyacinths ..... I, 346; II, 1333
Wreck near Pilot Town range beacon ..... I, 347
St. Jones River, Del., improvement of ..... I, 203; II, 1129
St. Joseph, Mo., improvement of Missouri River at ..... I, 511; II, 1595
St. Joseph Harbor and River, Mich.:
Dam near Berrien Springs ..... I, 830
Improvement of harbor ..... I, 640; III, 1947
Improvement of river ..... I, 642; III, 1948
St. Lawrence River, N. Y.:
Cape Vincent Harbor, improvement of ..... I, 731; III, 2125
Discharge of ..... I, 853; III, 2457
Ogdensburg Harbor, improvement of ..... I, 732; III, 2127
Ogdensburg Harbor, wreck in ..... I, 733; III, 2129
Thousand Island Park, examination and survey ..... I, 733
St. Louis, Mo.:
Improvement of Mississippi River between mouths of Missouri and Ohio rivers ..... I, 487; II, 1539
Survey for 14-foot waterway from the Gulf to, and thence to Lockport (Chicago), Ill., including report on water power and land drainage. .. I, 634, 812; III, 1933, 2657
St. Louis Bay and River, Minn. and Wis. *See* Duluth Harbor.
St. Marys River and St. Marys Falls Canal, Mich.:
Channels in waters connecting the Great Lakes, examination and survey. I, 698
Channels in waters connecting the Great Lakes, improvement of ..... I, 685; III, 2007, 2059
Commercial statistics ..... I, 690; III, 2016, 2059
Connecting waters between Lakes Superior and Huron, supplemental survey report, with estimate, etc., in re new lock at the falls ..... I, 698
Discharge of river ..... I, 853; III, 2457
Improvement of Hay Lake and Neebish channels ..... I, 691; III, 2036, 2059
Improvement of river at the falls ..... I, 687; III, 2009, 2059
Operating and care of canal ..... I, 690; III, 2012
Surveys, etc. (*see* Northern and Northwestern Lakes) ..... I, 842; III, 2443, 2459
St. Michael Canal, Alaska:
Examination and survey ..... I, 802
Improvement of ..... I, 801; III, 2231

St. Paul, Minn.:
See also Mississippi River.
Bridge across Mississippi River to Fort Snelling ..... I, 861; III, 2475
Gauging Mississippi River at ..... I, 510; II, 1593
St. Paul, Va., bridge across Clinch River ..... I, 817
St. Peters River, Minn. *See* Minnesota River.
St. Tammany Parish, La., bridge of ..... I, 826
Sakonnet Harbor, R. I., improvement of ..... I, 81, 938
Sakonnet River, R. I., improvement of ..... I, 82, 940
Salem County, N. J., bridge of ..... I, 829
Salem Creek, N. J., bridge at Course Landing ..... I, 829
Salem River, N. J., improvement of ..... I, 191; II, 1113
Salmon Bay, Wash. *See* Puget Sound-Lake Washington waterway.
Salmon Creek, N. Y. (*see* Pultneyville Harbor) ..... I, 727; III, 2117
Sampawams Point, N. Y., wreck off ..... I, 145; II, 1019
Sampit River, S. C.:
Harbor lines in Georgetown Harbor ..... I, 815
Improvement of Georgetown Harbor (*see* Winyah Bay) ..... I, 294; II, 1258
San Antonio Bay, Tex.:
Examination, etc., for waterway from the Rio Grande to Mississippi River, via ..... I, 451
Improvement of channel from Aransas Pass–Pass Cavallo channel to Victoria, on Guadalupe River, via ..... I, 443, 444; II, 1472, 1473
Survey of channel from Aransas Pass to Victoria and Cuero, on Guadalupe River, via ..... I, 451
San Antonio estuary, Cal. *See* Oakland Harbor.
Sandbeach (Harbor Beach), Mich.:
Improvement of harbor of refuge ..... I, 674; III, 1994
Water levels ..... I, 854; III, 2455, 2456
Wreck in Lake Huron near ..... I, 698; III, 2057
Sanders, H. Shelby, bridge of ..... I, 828
San Diego Harbor, Cal.:
Defenses of ..... I, 5
Improvement of ..... I, 733; III, 2131
Sandusky Harbor, Ohio, improvement of ..... I, 701; III, 2067
Sandwich Islands. *See* Hawaiian Islands.
Sandy Bay, Cape Ann, Mass., construction of harbor of refuge ..... I, 47, 903
Sandy Hook Bay, N. J., examination for breakwater at Atlantic Highlands ..... I, 175
Sandy Lake, Minn.:
Construction of reservoir dam ..... I, 499; II, 1581
Operating and care of reservoir dam ..... I, 502; II, 1584
San Francisco Bay and Harbor, Cal.:
Bridge across bay at Dumbarton Point ..... I, 823
Bridge across Newark Slough near Potrero (Dumbarton) Point ..... I, 821
Defenses of ..... I, 5
Engineer depot at Fort Mason ..... I, 15, 17, 875
Improvement of Oakland Harbor ..... I, 740; III, 2141
San Gabriel (Los Angeles) River, Cal., bridge at Long Beach ..... I, 829
Sanitary District of Chicago, Ill., application to reverse flow of Calumet River. I, 631
San Jacinto River, Tex., improvement of (*see* Galveston ship channel). I, 434; II, 1461
San Joaquin River, Cal.:
Improvement of ..... I, 743; III, 2144
Improvement of, by California Débris Commission ..... I, 809; III, 2253
Improvement of Stockton and Mormon channels ..... I, 744; III, 2146
San Juan Harbor, P. R.:
Defenses of ..... I, 12, 15
Improvement of ..... I, 806; III, 2239
San Leandro Bay, Cal. *See* Oakland Harbor.
San Luis Obispo Harbor, Cal., improvement of ..... I, 738; III, 2138
San Pablo Bay, Cal., improvement of ..... I, 742; III, 2143
San Pedro Bay and Harbor, Cal.:
Construction of deep-water harbor ..... I, 735; III, 2133
Improvement of Wilmington inner harbor, including removal of wreck .. I, 736; III, 2135
San Pedro, Los Angeles and Salt Lake Railroad Company, bridges of ..... I, 823, 829
San Rafael Creek, Cal., bridge across ..... I, 820
Santee River, S. C., improvement of ..... I, 297; II, 1260
Sarah plantation, La., bridge across Bayou Teche ..... I, 827

Sarasota Bay, Fla., improvement of ..... I, 338; II, 1321
Sasanoa River, Me., improvement of ..... I, 31, 888
Sassafras route, Chesapeake and Delaware Canal, examination of ..... I, 228
Saugatuck Harbor, Mich., improvement of ..... I, 645; III, 1952
Saugatuck River, Conn., improvement of ..... I, 116, 978
Saugerties Harbor, N. Y., improvement of ..... I, 139; II, 1012
Saugus River, Mass. *See* Lynn Harbor.
Sauk Rapids, Mississippi River, Minn., dam at ..... I, 830
Sauk Rapids Water Power Company, dam of ..... I, 830
Sauk River, Wis. (*see* Port Washington Harbor) ..... I, 616; III, 1892
Sault Ste. Marie, Mich. *See* St. Marys River.
Sausal Creek, Cal. *See* Oakland Harbor.
Savannah Harbor and River, Ga.:
  Bridge at Savannah ..... I, 829
  Defenses of ..... I, 5
  Improvement of harbor, including dredge construction ..... I, 305; II, 1106, 1271
  Improvement of river above Augusta ..... I, 310; II, 1282
  Improvement of river between Augusta and Savannah ..... I, 308; II, 1279
  Improvement of waterway to Beaufort, S. C. (*see* Savannah Harbor) . I, 305; II, 1271
  Improvement of waterway to Fernandina, Fla ..... I, 322; II, 1295
  Wreck in harbor, opposite Quarantine ..... I, 327; II, 1302
Saybrook Harbor, Conn. *See* Connecticut River.
Sayville, N. Y., improvement of Browns Creek ..... I, 135; II, 1004
Schodack Creek, N. Y., improvement at mouth (*see* Hudson River) .. I, 138; II, 1006
School of Application, Engineer, buildings for ..... I, 859, 860; III, 2473
Scituate Harbor, Mass., improvement of ..... I, 67, 921
Scott Point, Tennessee River, Ala., lock and dam at Hales bar ..... I, 528; II, 1628
Scuppernong River, N. C., improvement of ..... I, 263; II, 1222
Seaboard Air Line Railway Company, bridge of ..... I, 829
Seacoast defenses. *See* Fortifications.
Searchlights. *See* Fortifications.
Seattle, Wash.:
  Bridge across East and West waterways of Elliott Bay ..... I, 822
  Harbor lines ..... I, 815
  Improvement of Puget Sound-Lake Washington waterway ..... I, 791; III, 2221
Seattle Electric Company, bridge of ..... I, 822
Sea Wall (tugboat), wreck of ..... I, 146; II, 1021
Sea walls. *See* Fortifications.
Sebewaing River, Mich., improvement of ..... I, 672; III, 1993
Secretary Creek (Warwick River), Md., improvement of ..... I, 220; II, 1152
Seekonk (Pawtucket) River, R. I., improvement of ..... I, 83, 940
Sewell Point, Hampton Roads, Va., wreck off ..... I, 262; II, 1219
Shadle & Auchmuty, Messrs., bridge of ..... I, 824
Shallotte River, N. C., improvement of ..... I, 287; II, 1252
Sharp (tugboat), wreck of ..... I, 145; II, 1019
Shaws Cove, New London, Conn. *See* New London *and* Thames River.
Shears, The, Delaware Bay, Del., construction of harbor of refuge ... I, 184; II, 1103
Sheboygan Harbor and River, Wis., improvement of ..... I, 614; III, 1889
Shenango No. 1 (car ferry), wreck of ..... I, 716; III, 2096
Shepherdstown, W. Va., bridge across Potomac River ..... I, 819
Sheridan statue, Washington, D. C ..... I, 841; III, 2299
Shilshole Bay, Wash. *See* Puget Sound-Lake Washington waterway.
Shinnecock and Peconic Canal, N. Y., bridge across ..... I, 828
Ship Island Harbor and Pass, Miss.:
  Examination and survey of pass, and of channel to Gulfport and anchorage basin thereat ..... I, 395
  Improvement of pass and channel to Gulfport ..... I, 390; II, 1392
Shoal Harbor, N. J., improvement of ..... I, 168; II, 1069
Shooters Island, Newark Bay, examination and survey for channel north of. I, 175
Short Creek, Ala., bridge across Locust Fork, Black Warrior River, near ..... I, 824
Shreveport, La.:
  Improvement of Cypress Bayou ..... I, 455; II, 1489
  Improvement of Red River ..... I, 458; II, 1493
Shrewsbury River, N. J., improvement of ..... I, 171; II, 1073
Silver Springs Run, Fla., improvement of (*see* Oklawaha River) ..... I, 331; II, 1312
Sinepuxent Bay, Md., bridge at Ocean City ..... I, 825
Sioux City, Iowa (*see* Missouri River) ..... I, 511; II, 1595

Sioux River, S. Dak., ice harbor at Sioux City, Iowa ..... I, 511; II, 1595
Sites for fortifications. *See* Fortifications.
Siuslaw River, Oreg., improvement at mouth ..... I, 755; III, 2163
Sixmile Island, Allegheny River, Pa., lock and dam ..... I, 548, 549; II, 1699, 1703
Skagit Bay, Wash. (*see* Swinomish Slough) ..... I, 796; III, 2224
Skagit County, Wash., bridge of ..... I, 825
Skagit River, Wash., improvement of (*see* Puget Sound) ..... I, 785; III, 2214
Skidaway Narrows, Ga., improvement of ..... I, 323; II, 1297
Slack-water systems. *See* Canals *and* Waterways.
Slidell, La., bridge across Bayou Vincent ..... I, 826
Smith Creek, N. C.:
  Bridge at Oriental ..... I, 824
  Wreck near Oriental ..... I, 288
Smith Creek, Va., wreck in ..... I, 263; II, 1219
Smyrna River, Del., improvement of ..... I, 205; II, 1131
Snake Hill, N. J., bridge across Hackensack River ..... I, 827
Snake River, Idaho, Oreg., and Wash., improvement of ..... I, 759; III, 2168
Snelling, Fort, Minn., bridge across Mississippi River to St. Paul ..... I, 861; III, 2475
Snohomish River, Wash.:
  Bridge at Everett ..... I, 821
  Improvement of (*see* Puget Sound) ..... I, 785; III, 2214
  Improvement of Everett Harbor ..... I, 794; III, 2223
Snoqualmie River, Wash., improvement of (*see* Puget Sound) ..... I, 785; III, 2214
Soda (Sodo) Lake, La. *See* Cypress Bayou.
Somers Cove, Md., improvement of Crisfield Harbor ..... I, 227; II, 1161
Somers Point, N. J., bridge across Great Egg Bay ..... I, 823
Sonoma Creek, Cal., bridge across ..... I, 820
Sorrel Bayou, La. *See* Plaquemine Bayou.
Sorrell plantation, La., bridge across Bayou Teche ..... I, 827
Southampton County, Va., bridge of ..... I, 823
South and Western Railroad Company:
  Bridges across Clinch River, Va. ..... I, 817
  Bridge across North Fork of Holston River, Tenn. ..... I, 817
  Bridge across South Fork of Holston River, Tenn ..... I, 817
South Atlantic States, removal of water hyacinths from Florida waters. I, 346; II, 1333
South Branch, Chicago River, Ill. *See* Chicago Harbor and River.
South Branch, Penobscot River, Me., examination and survey at Frankfort ..... I, 43
South Branch, Shrewsbury River, N. J., improvement of ..... I, 171; II, 1073
South Chicago Harbor, Ill. (*see* Calumet Harbor) ..... I, 628; III, 1924
South Creek, N. C., bridge near Aurora ..... I, 820
Southern Branch, Elizabeth River, Va.:
  Improvement of Norfolk Harbor and its approaches, including Hospital Point ..... I, 250; II, 1201
  Improvement of waterway to Albemarle Sound, via Currituck Sound ..... I, 258; II, 1213
  Improvement of waterway to sounds of North Carolina, via Pasquotank River ..... I, 258; II, 1212
Southern Pacific Company:
  Bridge across Newark Slough, Cal ..... I, 821
  Bridge across San Francisco Bay, Cal ..... I, 823
Southern Railway Company, bridges of ..... I, 821, 824
South Fork, Cumberland River, Ky., improvement by Cumberland River Improvement Company ..... I, 522; II, 1613
South Fork, Forked Deer River, Tenn. *See* Forked Deer River.
South Fork, Holston River, Tenn., bridge near Kingsport ..... I, 817
South Fork, Kentucky River, Ky., bridge at Beattyville ..... I, 821
South Haven Harbor, Mich., improvement of ..... I, 643; III, 1950
South Hero Island channel (The Gut), Lake Champlain, Vt.:
  Bridge across ..... I, 828
  Improvement of ..... I, 71
South Kingston, R. I. *See* Point Judith Harbor and Pond.
South Menominee Canal, Milwaukee, Wis., bridge across ..... I, 824
South Norwalk Harbor, Conn.:
  Examination and survey ..... I, 118
  Improvement of (*see* Norwalk Harbor) ..... I, 111, 975
South Pass, Mississippi River:
  Examinations and surveys ..... I, 399; II, 1412
  Maintenance of channel ..... I, 400; II, 1413
Southport, Conn., improvement of harbor ..... I, 114, 977

Southport, Me., bridge of town of, across Deckers Cove ..... I, 827
South Quay, Va., bridge across Blackwater River ..... I, 823
South River, N. J.:
Examination and survey of old mouth of ..... I, 175
Improvement of ..... I, 166; II, 1063
Southwest Baltimore, Md., improvement of harbor of ..... I, 211; II, 1142
Southwest Pass, Mississippi River, La., improvement of ..... I, 396; II, 1400
Spooner, M. A., dam across Mississippi River at Bemidji, Minn ..... I, 830
Springdale, Pa.:
Construction of lock and dam in Allegheny River ..... I, 548; II, 1699
Operating and care of lock and dam in Allegheny River ..... I, 549; II, 1703
Spring Garden, Baltimore, Md., improvement of harbor at ..... I, 211; II, 1142
Springhill, Pa., bridge across Cheat River ..... I, 826
Spuyten Duyvil Creek, N. Y. (*see* Harlem River) ..... I, 133; II, 1001
Squan (Manasquan) River, N. J., improvement of ..... I, 173; II, 1076
Stamford Harbor, Conn., improvement of ..... I, 113, 976
Starbuck Island, Hudson River, N. Y., harbor lines ..... I, 814, 815
Starnes Bend, Clinch River, Va., bridge near ..... I, 818
Staten Island, N. Y.:
See also Staten Island-New Jersey channel.
Harbor lines at St. George ferry terminal ..... I, 814
Improvement of Lemon Creek ..... I, 158; II, 1050
Staten Island-New Jersey channel:
Examination for channel from Kill van Kull north of Shooters Island to near Corner Stake light, including reef at Bergen Point light ..... I, 175
Improvement of ..... I, 157, 158; II, 1048
Wreck in Kill van Kull ..... I, 174; II, 1077
Staten Island Sound (Arthur Kill), N. Y. and N. J. *See* Staten Island-New Jersey channel.
Statistics of commerce, Sault Ste. Marie canals, Mich ..... I, 690; III, 2016, 2059
Statues, memorials, etc.:
In public grounds, Washington, D. C ..... I, 841; III, 2299
Monument marking birthplace of George Washington ..... I, 841; III, 2299
Monument on Kings Mountain battle ground, S. C ..... I, 861
Monument to Gen. Hugh Mercer ..... I, 841; III, 2299
Monument to memory of soldiers who fell in the battle of New Orleans .. I, 862
Tablet to Abraham Lincoln ..... I, 841; III, 2299
Statutes of 59th Congress, 2d session, affecting Corps of Engineers ..... III, 2477
Steamboats, etc. *See* Dredge boats *and* Wrecks.
Steuben, General Baron von, statue of ..... I, 841; III, 2299
Stilaguamish River, Wash., improvement of (*see* Puget Sound) ..... I, 785; III, 2214
Stillwater Harbor, Minn. (*see* St. Croix River) ..... I, 503; II, 1587
Stockbridge Landing, Lake Winnebago, Wis. (*see* Fox River) ..... I, 622; III, 1907
Stockton Channel, San Joaquin River, Cal., improvement of ..... I, 744; III, 2146
Stones Ferry, Tombigbee River, Ala., bridge at ..... I, 818
Strong, Eliza H. (steamer), wreck of ..... I, 698; III, 2057
Structures, bridges and other, erection of. *See* Buildings, Piers, *and* Rivers and harbors.
Sturgeon Bay, Wis., bridge across, at Sturgeon Bay ..... I, 829
Sturgeon Bay and Lake Michigan Canal, Wis.:
Improvement of, including harbor of refuge ..... I, 608; III, 1874
Operating and care ..... I, 610; III, 1880
Sturgeon Bay Bridge Company, bridge of ..... I, 829
Subic Bay, Philippine Islands, defenses of ..... I, 11, 12, 15
Submarine defense. *See* Fortifications.
Suffolk County, N. Y., bridge of ..... I, 828
Sullivan Falls Harbor, Me., improvement of ..... I, 23, 880
Sullivan River, Me., improvement of Sullivan Falls Harbor ..... I, 23, 880
Sulphur River, Ark. and Tex., improvement of ..... I, 457; II, 1491
Sumpawanus (Sampawams) Point, N. Y., wreck off ..... I, 145; II, 1019
Sumpwams (Sampawams) Point, N. Y., wreck off ..... I, 145; II, 1019
Sunflower County, Miss., bridge of ..... I, 817
Sunflower River, Miss. *See* Big Sunflower River.
Sunken craft. *See* Wrecks.
Superior Bay and Harbor, Wis.:
Bridges across St. Louis Bay ..... I, 824, 826
Examination and survey ..... I, 603
Improvement of ..... I, 586; II, 1827

Superior Lake:
See also Northern and Northwestern Lakes.
Commercial statistics, Sault Ste. Marie canals, Mich..... I, 690; III, 2016, 2059
Improvement and care of waterway to Keweenaw Bay..... I, 507, 509; II, 1853
Survey of connecting waters between Lake Huron and, supplemental report, with estimate, etc., in re new lock at St. Marys Falls Canal, Mich..... I, 698
Water levels and discharges..... I, 853, 854; III, 2455, 2456, 2457
Supervision of New York Harbor, N. Y..... I, 808; III, 2245
Surface levels. *See* Gauging.
Surgoinsville, Tenn., bridge across Holston River..... I, 823
Surveys:
Of Northern and Northwestern Lakes..... I, 842, 848, 852, 853; III, 2443, 2459
Of rivers and harbors, under act of March 2, 1907..... I, 21
Susquehanna Power Company, dam of..... I, 830
Susquehanna River, Md.:
Bridge at Havre de Grace..... I, 828
Dam near Conowingo..... I, 830
Improvement of..... I, 213; II, 1144
Suwanee County, Fla.:
Bridge across Suwanee River at Branford..... I, 820
Bridge across Suwanee River at Lurayville..... I, 822
Suwanee River, Fla.:
Bridge at Branford..... I, 820
Bridge at Lurayville..... I, 822
Improvement of..... I, 343; II, 1328, 1330
Swansboro, N. C., improvement of waterway to New River and Beaufort.. I, 277, 279; II, 1236
Swedback, E. J., dam across Mississippi River at Bemidji, Minn..... I, 830
Swinomish Slough, Wash.:
Bridge near La Conner..... I, 825
Improvement of..... I, 796; III, 2224
Improvement of (*see* Puget Sound)..... I, 785; III, 2214
Synepuxent (Sinepuxent) Bay, Md., bridge at Ocean City..... I, 825

T.

Tacoma Harbor, Wash.:
Bridge across City waterway (city bridge)..... I, 824
Bridges across Puyallup River..... I, 820, 824
Improvement of..... I, 789; III, 2219
Tail Point light, Green Bay, Wis., wreck near..... I, 624; III, 1915
Tallahatchie River, Miss., improvement of..... I, 469, 470; II, 1509, 1510
Tampa Bay and Harbor, Fla.:
Bridge across Hillsboro Bay at Tampa..... I, 822
Bridge across inlet of Hillsboro Bay near Tampa..... I, 824
Defenses of..... I, 5
Harbor lines in Hillsboro River..... I, 815
Improvement of bay..... I, 340; II, 1324
Improvement of Hillsboro Bay and River..... I, 341; II, 1326
Wrecks in Hillsboro River..... I, 347
Tampa Northern Railroad Company, bridges across Hillsboro Bay and River, Fla..... I, 824
Tampa Terminal Company, bridge of..... I, 822
Tanana River, Alaska, wreck at Chena..... I, 802; III, 2232
Tar River, N. C.:
Examination and survey..... I, 288
Improvement of..... I, 265; II, 1224
Tarrytown Harbor, N. Y., improvement of..... I, 143; II, 1017
Taunton River, Mass.:
Improvement of..... I, 81, 939
Improvement of Fall River Harbor..... I, 86, 944
Taylors Bayou, Tex. *See* Sabine River *and* Port Arthur Canal.
Tchefuncte River, La., improvement of..... I, 411; II, 1433
Tchula Lake, Miss., improvement of..... I, 469, 472; II, 1511
Teche Bayou, La.:
Bridge at Bayside plantation, near Jeanerette..... I, 828
Bridges at Sarah and Sorrell plantations..... I, 827
Examination and survey of waterway from Franklin to Mermentau (*see* Rio Grande-Mississippi River waterway)..... I, 451

Teche Bayou—Continued.
Improvement of ..... I, 407; II, 1428
Improvement of waterway from Franklin to Mermentau ..... I, 415; II, 1437
Removal of sunken logs ..... I, 409; II, 1430
Removal of water hyacinths ..... I, 427; II, 1450
Telegraph line, Government, Washington, D. C ..... I, 841; III, 2299
Tennessee River:
Bee Tree shoals, Ala., improvement of ..... I, 528; II, 1630
Chattanooga, Tenn., improvement above ..... I, 526; II, 1621
Chattanooga, Tenn., to Riverton, Ala., improvement from ..... I, 528 II, 1626
Colbert shoals, Ala., improvement of ..... I, 528, II, 1630
Gauging (*see* Mississippi River Commission) ..... I, 812; III, 2610, 2648
Hales bar (near Scott Point) lock and dam, construction of ..... I, 528; II, 1628
Muscle Shoals Canal, Ala., operating and care ..... I, 531 II, 1639
Riverton, Ala., improvement below ..... I, 530 II, 1634
Wreck at Florence, Ala ..... I, 536 II, 1652
Tensas River, La., improvement of ..... I, 463, 465; II, 1503
Terraceia Cut-off, Fla. (*see* Manatee River) ..... I, 339; II, 1322
Terry, Mont., bridge across Yellowstone River ..... I, 817
Texas City Harbor, Tex., improvement of channel to Galveston ..... I, 433; II, 1459
Texas, State of:
Examinations and surveys of inland waterways along coast, and thence to Mississippi River ..... I, 451
Improvement of inland waterways along coast ..... I, 443; II, 1471
Removal of water hyacinths from waters in ..... I, 427; II, 1450
Thames River, Conn.:
Bridge (city) across Winthrop Cove, New London Harbor ..... I, 823
Bridge (railroad) across Winthrop Cove, New London Harbor ..... I, 824
Examination to Allyns Point ..... I, 118
Examination of New London Harbor ..... I, 117
Improvement of ..... I, 96, 958
Improvement of New London Harbor ..... I, 96, 956
The Board of Engineers ..... I, 5, 865
The Gut (between North and South Hero islands), Lake Champlain, Vt.:
Bridge across ..... I, 828
Improvement of ..... I, 71
Thousand Island Park, St. Lawrence River, N. Y., examination and survey ..... I, 733
Threemile Rapids, Columbia River, Oreg. and Wash., improvement at ..... I, 762; III, 2171
Three Sisters (schooner), wreck of ..... I, 263; II, 1219
Thromps Point, Lake Champlain, Vt., bridge across "The Gut" ..... I, 828
Thunder Bay Harbor and River, Mich., improvement of ..... I, 669; III, 1990
Thunder Bay Island light-house, Mich., wreck near ..... I, 698; III, 2058
Tickfaw River, La., improvement of, including tributaries ..... I, 412; II, 1434
Tillamook Bay and bar, Oreg., improvement of, including dredge construction ..... I, 757, 758; III, 2166, 2168
Tinicum Island, Delaware River, wreck near ..... I, 185; II, 1103
Tiverton, R. I. *See* Sakonnet River.
Tolay Creek, Cal., bridge across ..... I, 820
Toledo Harbor, Ohio:
Bridge (city) across Maumee River ..... I, 824
Improvement of ..... I, 699; III, 2061
Wreck off ..... I, 716; III, 2096
Tombigbee River, Ala. and Miss.:
Bridge at Stones Ferry, Ala ..... I, 818
Columbus to Walkers Bridge, Miss., improvement from ..... I, 381; II, 1378
Demopolis, Ala., improvement below ..... I, 376, 378; II, 1372, 1376
Demopolis, Ala., to Columbus, Miss., examination and survey ..... I, 395
Demopolis, Ala., to Columbus, Miss., improvement from ..... I, 380; II, 1377
Tonawanda Harbor, N. Y., improvement of ..... I, 725; III, 2112
Tonnage, Sault Ste. Marie canals, Mich ..... I, 690; III, 2016, 2059
Torpedoes. *See* Fortifications.
Town River, Mass., improvement of ..... I, 65, 920
Traceys Creek, Md., bridge near Traceys Landing ..... I, 827
Traceys Landing, Md., bridges across Traceys and Rock Hole creeks, near ..... I, 827
Trail Creek, Ind.:
Bridge at Michigan City ..... I, 822
Improvement of Michigan City Harbor ..... I, 632; III, 1930

Trappe River, Md. (*see* La Trappe River) ..... I, 222 II, 1154
Traps, fish:
In Puget Sound, Wash., inspection, etc., of ..... I, 787; III, 2217
Permits for construction of ..... I, 829
Traverse Lake, Minn., survey of ..... I, 509; II, 1593
Trent River, N. C.:
Bridges at Polloksville ..... I, 822, 823
Improvement of ..... I, 270; II, 1229
Trinity River, Tex.:
Bridge of Beaumont, Sour Lake and Western Railway Company across .. I, 820
Improvement above mouth ..... I, 454; II, 1486
Improvement of mouth ..... I, 436, 438; II, 1466
Trojan (steamer), wreck of ..... I, 94, 953
Troops, engineer equipment of ..... I, 18, 869, 873, 875
Troy, N. Y.:
See also Hudson River.
Harbor lines in Hudson River ..... I, 814, 815
Wreck at ..... I, 147; II, 1022
Tryon, Thomas (canal boat), wreck of ..... I, 146; II, 1020
Tuckerton Creek, N. J., improvement of ..... I, 194; II, 1116
Tug Fork, Big Sandy River, W. Va. and Ky.:
Bridge at Williamson, W. Va ..... I, 819
Improvement of ..... I, 565; II, 1771
Tunnels, Chicago River, alteration of ..... I, 627; III, 1922
Turners Cut, N. C., waterway via ..... I, 258; II, 1212
Turtle Bayou, Tex., improvement of ..... I, 436
Turtle Cove, Tex.:
Improvement of channel from Aransas Pass to Corpus Christi, via .. I, 443, 445; II, 1473
Survey of channel from Aransas Pass to Corpus Christi, via ..... I, 451
Turtle River, Ga. *See* Brunswick Harbor.
Tusler, Mont., bridge across Yellowstone River ..... I, 817
Tuthill, Fannie (tug), wreck of ..... I, 698; III, 2057
Twelvemile Bayou, La. *See* Cypress Bayou.
Twelvemile Creek, Fla. (*see* Orange River) ..... I, 336; II, 1318
Twin rivers, Wis. *See* Two Rivers Harbor.
Two Harbors, Minn., improvement of Agate Bay ..... I, 585; II, 1825
Two Rivers Harbor, Wis:
Harbor lines in East Twin River ..... I, 815
Improvement of ..... I, 612; III, 1884
Tyaskin, Md. *See* Tyaskin Creek.
Tyaskin (Wetipquin) Creek, Md., improvement of ..... I, 224; II, 1156

U.

Union Lake, Wash., improvement of waterway via ..... I, 791; III, 2221
Union Parish, La., bridge of ..... I, 821
Union River, Me., improvement of ..... I, 24, 881
Urbana Creek, Va., improvement of ..... I, 243; II, 1185
Utica, Ill., bridge of town of ..... I, 825

V.

Vancouver, Wash.:
See also Columbia River.
Bridge across Columbia River and Oregon Slough ..... I, 817
Bridge across Columbia Slough ..... I, 824
Vandruffs Island, Rock River, Ill., dams at ..... I, 830
Van Wies Point, Hudson River, N. Y., harbor lines ..... I, 814
Venango County, Pa., bridge of ..... I, 822
Vermilion Bayou, La.:
Bridge at Dormas Broussard Crossing ..... I, 826
Improvement of channel, bay, and passes ..... I, 416; II, 1437
Vermilion Harbor, Ohio, improvement of ..... I, 705; III, 2072
Vessels. *See* Dredge boats *and* Wrecks.
Vicksburg Harbor, Miss., improvement of ..... I, 467; II, 1507
Vicksburg, Shreveport and Pacific Company, bridge of ..... I, 820

Victoria, Tex.:
Improvement of channel to Aransas Pass ..... I, 443, 444; II, 1473
Survey for channel to Cuero and to Aransas Pass ..... I, 451
Vinalhaven, Me., improvement of Carvers Harbor ..... I, 30, 886
Vincent Bayou, La., bridge at Slidell ..... I, 826
Vineyard Haven Harbor, Mass.:
Improvement of ..... I, 77, 934
Wreck in Vineyard Sound, off West Chop ..... I, 94, 954
Vineyard Sound, Mass., wrecks in ..... I, 94, 953, 954
Virginia and Carolina Coast Railroad Company, bridges of ..... I, 820, 823, 824
Volusia bar, St. Johns River, Fla., improvement of ..... I, 330; II, 1310
Von Steuben, General Baron, statue of ..... I, 841; III, 2299

W.

Wabash River, Ind. and Ill.:
Bridge near Mount Carmel, Ill ..... I, 818
Improvement above Vincennes, Ind ..... I, 576, 578; II, 1805, 1806
Improvement below Vincennes, Ind ..... I, 576; II, 1805
Operating and care of Grand Rapids lock and dam ..... I, 578; II, 1807
Waccamaw River, N. C. and S. C., improvement of ..... I, 289; II, 1253
Wade, Arthur C. (schooner), wreck of ..... I, 327; II, 1302
Wakefield, R. I. *See* Point Judith Harbor and Pond.
Wakefield, Va., monument and wharf ..... I, 841; III, 2299
Wappinger Creek, N. Y.:
Bridges across ..... I, 825, 828
Improvement of ..... I, 142; II, 1016
War College, Army, Washington, D. C., erection of buildings for ..... I, 859; III, 2473
War maps ..... I, 858
Warrior River, Ala.:
Bridge across Locust Fork near Short Creek ..... I, 824
Improvement above Tuscaloosa ..... I, 373; II, 1370
Improvement below Tuscaloosa ..... I, 374; II, 1371
Operating and care of locks and dams ..... I, 382; II, 1379
Warroad Harbor and River, Minn., improvement of ..... I, 508; II, 1591
Warwick River, Md., improvement of ..... I, 220; II, 1152
Washington, D. C.:
Aqueduct Bridge across Potomac River, repair of ..... I, 830; III, 2271
Aqueduct, filtration plant ..... I, 838, 839; III, 2289, 2291
Aqueduct, maintenance and repair ..... I, 836; III, 2283
Army War College, buildings for ..... I, 859; III, 2473
Barracks. *See* Washington Barracks.
Defenses of ..... I, 5
Engineer depot ..... I, 15, 16, 867
Engineer School of Application, buildings for ..... I, 859, 860; III, 2473
Executive Mansion and office ..... I, 841; III, 2299
Highway Bridge, Potomac River, replacing Long Bridge ..... I, 832; III, 2273
Improvement of Anacostia River at ..... I, 232; II, 1168
Improvement of Potomac River at ..... I, 229; II, 1163
Improvement of Potomac River below ..... I, 231; II, 1167
Public buildings and grounds, and Washington Monument ..... I, 841; III, 2299
Sea wall, Potomac River, between Arsenal wall and N street ..... I, 841; III, 2299
Statues and memorials in public grounds ..... I, 841; III, 2299
Telegraph line connecting Executive Departments ..... I, 841; III, 2299
Washington, N. C. *See* Pamlico *and* Tar rivers.
Washington and Vandemere Railroad Company, bridge of ..... I, 820
Washington Barracks, D. C.:
Engineer depot ..... I, 15, 16, 867
Engineer School, buildings for ..... I, 859, 860; III, 2473
War College buildings ..... I, 859; III, 2473
Washington County, Miss., bridge of ..... I, 817
Washington County, Pa., bridge of ..... I, 828
Washington, George, monuments to:
At Wakefield, Va ..... I, 841; III, 2299
At Washington, D. C ..... I, 841; III, 2299
Washington Lake, Wash., improvement of waterway to Puget Sound ..... I, 791; III, 2221
Washington State, dredging plant for harbors on coast ..... I, 758; III, 2168

Washita (Ouachita) River, Ark. and La. *See* Ouachita River.
Watch Hill Harbor, R. I. (*see* Pawcatuck River) ..... I, 95, 955
Water craft. *See* Dredge boats *and* Wrecks.
Wateree River, S. C., improvement of ..... I, 298; II, 1262
Waterford, N. Y., examination and survey of Hudson River for extending existing project to ..... I, 148
Water hyacinths, removal of:
From Florida waters ..... I, 346; II, 1333
From Louisiana waters ..... I, 427; II, 1450
From Texas waters ..... I, 427; II, 1450
Water-level observations:
Columbia River, Oreg. and Wash ..... I, 779; III, 2208
Michigan Lake, variations in surface level on east shore ..... I, 640
Mississippi River and principal tributaries ..... I, 510, 812; II, 1593; III, 2610, 2648
Northern and Northwestern Lakes, levels and discharges ..... I, 853, 854; III, 2455, 2456
Waters, navigable. *See* Bridges, Rivers and harbors, *and* Wrecks.
Water supply, Washington, D. C. *See* Washington, D. C.
Waterways (*see also* Canals):
Beaufort, N. C., to Newbern ..... I, 272; II, 1232
Beaufort, N. C., to New River ..... I, 277, 279; II, 1236
Charleston to McClellanville, S. C ..... I, 302; II, 1265
Chesapeake Bay to Delaware Bay ..... I, 228
Chicago (Lockport), Ill., to St. Louis, Mo., and the Gulf, via Illinois, Des Plaines, and Mississippi rivers ..... I, 634, 812; III, 1933, 2057
Franklin, La., to Mermentau (*see also* Rio Grande-Mississippi River waterway) ..... I, 415, 451; II, 1437
Galveston to Houston, Tex ..... I, 434; II, 1461
Keweenaw Bay to Lake Superior, Mich ..... I, 597, 599; II, 1853
Mermentau River, La., to Mississippi River (*see also* Rio Grande-Mississippi River waterway) ..... I, 415, 451; II, 1437
New River, N. C., to Swansboro and Beaufort ..... I, 277, 279; II, 1236
Norfolk, Va., to Albemarle Sound, N. C., via Currituck Sound ..... I, 258; II, 1213
Norfolk, Va., to Beaufort Inlet, N. C ..... I, 263
Norfolk, Va., to sounds of North Carolina, via Pasquotank River ..... I, 258; II, 1212
Pamlico Sound, N. C., to Beaufort Inlet, examination and survey (*see* Norfolk-Beaufort Inlet waterway) ..... I, 263
Pamlico Sound, N. C., to Beaufort Inlet, improvement ..... I, 271; II, 1231
Pamlico Sound, N. C., to Norfolk, Va ..... I, 258; II, 1212
Portage Lake and Lake Superior canals ..... I, 597, 599; II, 1853
Puget Sound to Lake Washington ..... I, 791; III, 2221
Rio Grande River, Tex., to Mississippi River at Donaldsonville, La ..... I, 451
Savannah, Ga., to Beaufort, S. C. (*see* Savannah Harbor) ..... I, 305; II, 1271
Savannah, Ga., to Fernandina, Fla ..... I, 322; II, 1295
Teche Bayou, La., to Mermentau River (*see also* Rio Grande-Mississippi River waterway) ..... I, 415, 451; II, 1437
Texas coast ..... I, 443, 451; II, 1471
Waukegan Harbor, Ill., improvement of ..... I, 621; III, 1905
Weirs:
Fish, in Puget Sound, Wash., inspection, etc., of ..... I, 787; III, 2217
Permits for construction of ..... I, 829
Weldon, N. C.:
See also Roanoke River.
Bridge across Roanoke River ..... I, 816
West Chop, Vineyard Haven, Mass., wreck off ..... I, 94, 954
Western Branch, Elizabeth River, Va., improvement of ..... I, 252; II, 1204
West Fork of South Branch, Chicago River, Ill. *See* Chicago Harbor and River.
West Galveston Bay, Tex.:
Examination and survey for waterway via ..... I, 451
Improvement of ..... I, 436, 441, 443; II, 1469, 1471
West (Hay) Harbor, Fishers Island, N. Y., examination and survey ..... I, 118
West Haven, Conn.:
Bridge across West River to New Haven ..... I, 823
Improvement of West River ..... I, 105, 967
West Neebish channel, St. Marys River, Mich., improvement of ..... I, 691; III, 2036, 2059
Westport Harbor, Conn., improvement of ..... I, 116, 978

West River, Conn.:
Bridge between New Haven and West Haven ..... I, 823
Improvement of ..... I, 105, 967
West Seattle, Wash., bridge across East and West waterways of Elliott Bay .. I, 822
West Twin River, Wis. *See* Two Rivers Harbor.
West waterway, Seattle, Wash., bridge across ..... I, 822
Wetipquin (Tyaskin) Creek, Md., improvement of ..... I, 224; II, 1156
Weymouth River, Mass., improvement of ..... I, 63, 64, 918
Wharves:
Permits for construction of ..... I, 829
Permits for construction of, in Porto Rico ..... I, 816
Whatcom (Bellingham) Harbor, Wash.:
Harbor lines in I and J streets waterway ..... I, 815
Improvement of Whatcom Creek waterway ..... I, 797; III, 2225
Wheeling Island, Ohio River, W. Va., bridge at ..... I, 816
White Cliffs, Ark., bridge across Little River ..... I, 827
Whitehall, N. Y., improvement of Narrows of Lake Champlain ..... I, 73, 926
White House, Washington, D. C ..... I, 841; III, 2299
White Lake Harbor, Mich., improvement of ..... I, 654; III, 1970
White River, Ark.:
Gauging (*see* Mississippi River Commission) ..... I, 812; III, 2610, 2648
Improvement by open-channel work ..... I, 476; II, 1521
Improvement of upper river by locks and dams ..... I, 478; II, 1523
Operating and care of locks and dams ..... I, 479; II, 1524
White River, Ind., improvement of ..... I, 579; II, 1808
White Salmon River, Wash., bridge across ..... I, 825
Wicomico River, Md., improvement of ..... I, 226; II, 1160
Willamette River, Oreg.:
Bridge at Oswego ..... I, 826
Bridge near Wilsonville ..... I, 821
Improvement above Portland ..... I, 768; III, 2185
Improvement below Portland, including dredge construction ..... I, 771; II, 1105; III, 2189
Willapa River and Harbor, Wash.:
Bridge across Wilson Creek ..... I, 828
Improvement of, including dredge construction ..... I, 758, 780; III, 2209
Williamsburg County, S. C., bridge of ..... I, 826
Williamson, W. Va., bridge across Tug Fork, Big Sandy River ..... I, 819
Williamsport Bridge Company, bridge of ..... I, 828
Wilmington, Cal.:
Construction of deep-water harbor in San Pedro Bay ..... I, 735; III, 2133
Improvement of inner harbor, including removal of wreck ..... I, 736; III, 2135
Wilmington, Del., improvement of harbor ..... I, 196; II, 1118
Wilmington, N. C.:
Defenses of Cape Fear River ..... I, 5
Improvement of Cape Fear River above ..... I, 282; II, 1244
Improvement of Cape Fear River at and below ..... I, 284; II, 1246
Wilson Creek, Wash., bridge at Willapa ..... I, 828
Wilsonville, Oreg., bridge across Willamette River ..... I, 821
Wind River, Wash., bridge across ..... I, 825
Winnebago Lake, Fox River, Wis.:
Improvement of (*see* Fox River) ..... I, 622; III, 1907
Survey of, for charting purposes ..... I, 624
Winnibigoshish Lake, Minn.:
Construction of reservoir dam ..... I, 499; II, 1581
Operating and care of reservoir dam ..... I, 502; II, 1584
Winthrop, N. C., bridge across Adams Creek ..... I, 824
Winthrop Cove, New London Harbor, Conn.:
Bridge of city ..... I, 823
Bridge of New York, New Haven and Hartford R. R ..... I, 824
Improvement of ..... I, 96, 956
Winyah Bay, S. C., improvement of ..... I, 294; II, 1258
Wisconsin Entrance, Duluth-Superior Harbor, Minn. and Wis. *See* Duluth Harbor.
Wishkah River, Wash., bridge at Aberdeen ..... I, 826
Witch of the Bay (scow-schooner), wreck of ..... I, 749; III, 2151

Yaquina Bay, Oreg., improvement of ..... I, 756; III, 2165
Yarmouth, Mass., bridge across Bass River ..... I, 827
Yazoo River, Miss.:
Bridge at Belzoni ..... I, 817
Improvement above mouth ..... I, 469; II, 1508
Improvement of mouth, including Vicksburg Harbor ..... I, 467; II, 1507
Yellow Mill channel, Bridgeport, Conn., harbor lines ..... I, 814
Yellow Mill Pond, Bridgeport, Conn. (*see* Bridgeport Harbor) ..... I, 108, 972
Yellowstone National Park, improvement of ..... I, 856; III, 2461
Yellowstone River, Mont., bridges at Tusler, Terry, and Miles City ..... I, 817
York County, Me., bridge of ..... I, 826
York Harbor and River, Me.:
Bridge across Cape Neddick River ..... I, 823
Bridge across York River ..... I, 826
Improvement of ..... I, 40, 894
York River, Va., improvement of ..... I, 235; II, 1173
York Spit, Chesapeake Bay, Va., shoals opposite (*see* Patapsco River) ..... I, 208; II, 1137
Yuba River, Cal., improvement by California Débris Commission, with report on future operations ..... I, 809; III, 2253, 2262
Yukon (barge), wreck of ..... I, 716; III, 2096

Z.

Zimmerman, John R. (barge), wreck of ..... I, 262; II, 1219

O

UNIVERSITY OF MICHIGAN
3 9015 06224 9035

Yaquina Bay, Oreg., improvement of ..... I, 756; III, 2165
Yarmouth, Mass., bridge across Bass River ..... I, 827
Yazoo River, Miss.:
Bridge at Belzoni ..... I, 817
Improvement above mouth ..... I, 469; II, 1508
Improvement of mouth, including Vicksburg Harbor ..... I, 467; II, 1507
Yellow Mill channel, Bridgeport, Conn., harbor lines ..... I, 814
Yellow Mill Pond, Bridgeport, Conn. (*see* Bridgeport Harbor) ..... I, 108, 972
Yellowstone National Park, improvement of ..... I, 856; III, 2461
Yellowstone River, Mont., bridges at Tusler, Terry, and Miles City ..... I, 817
York County, Me., bridge of ..... I, 826
York Harbor and River, Me.:
Bridge across Cape Neddick River ..... I, 823
Bridge across York River ..... I, 826
Improvement of ..... I, 40, 894
York River, Va., improvement of ..... I, 235; II, 1173
York Spit, Chesapeake Bay, Va., shoals opposite (*see* Patapsco River) ..... I, 208; II, 1137
Yuba River, Cal., improvement by California Débris Commission, with report on future operations ..... I, 809; III, 2253, 2262
Yukon (barge), wreck of ..... I, 716; III, 2096

Z.

Zimmerman, John R. (barge), wreck of ..... I, 262; II, 1219

O

UNIVERSITY OF MICHIGAN
3 9015 06224 9035